The Builder.

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Printing Premises, Cornwall-street, Birmingham ..... Messrs. Bateman & Bateman, Architects.
A Street Front ..... Designed by Mr. W. Moss Settle
Office Buildings: 4, Coleman-street, E.C. ..... Mr. E. Flint, F.R.I.B.A., Architect.
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The Fallen Campanile.

IT was with a sense of incredulity, of hardly believing our own eyes, that many of us must have read the announcement in the papers of Tuesday of the Fall of the Campanile of St. Mark. The catastrophe came upon the world so suddenly and without warning, for the signs of some instability of the tower, and the precautions which had just been taken to warn people away from its immediate vicinity, do not seem to have made their way to public notice much beyond Venice. It is a strange fate that this sudden collapse should be the end of an erection of which Fergusson rather harshly observed that "its size, its height, and its apparent solidity, are its only merits"; and on which only a few days ago the writer of an article on "Impressions Vénitiennes" in the *Revue Générale* observed that "son énormité fruste avait, sous le baiser lumineux du matin, un air d'héroïque jeunesse."

From first to last the life of the tower counts almost 1000 years, for it was founded by Tiepolo in 902, but this only represents the life of the foundations and of the lower portion of the structure, not of the whole as we have been accustomed to see it. From some reason or other, very likely connected with intestine warfare and the consequent unsettled state of things, it took the Venetians two hundred and fifty years to carry it up to the then lantern or *cella* stage, and another quarter of a century to finish the cella. Fergusson, in his "History," suggests that at this period its general appearance was probably very similar to that of the tower of Piacenza Cathedral; a plain stalk with long pilaster-like features, an arcaded belfry stage, and a short circular spire planted on the top of this. But the Campanile, though called in ordinary parlance the Campanile of St. Marks, has really no connexion with the basilica, and is not so much a church tower as a civic tower, an emblem of the power of Venice. Hence it was thought, in after time, that it was not large or resplendent enough for the occasion, and the whole of the arcaded story was rebuilt, probably the cornice below much increased in scale and dignity, and the awkward-looking square box stage was built over it, apparently simply as a means of gaining height, for it has no architectural significance and certainly no architectural beauty. The existence of this box story seems sufficient to show that the stalk of the tower was not raised, and that the arcaded story was at the same height as the original one; for if they had commenced raising the stalk higher, they would surely have continued that much better and more architectural method of gaining increased height. But the tale told by the structure seems to us to be, that the arcade story was first rebuilt at its old height, merely to give it a more ornate and sumptuous appearance, and afterwards came the conviction—"It is not high enough; we must raise it further"; and so followed the interposition of what we call the box story between that and the square spire which was to be the ultimate crown of the edifice. All this was done about 1510 by Maestro Buono, who decorated it with marbles brought from Greece and from other parts of Italy, in accordance with the long-entertained covetous habit of the Venetian Doges in regard to the rich materials owned by other states.

The æsthetic judgment of Fergusson on the tower, though as observed, it sounds harsh to minds full of the spell of Venice, is we think correct. The Campanile had gained a kind of glamour from its association with the wonderful city, and its proximity and nominal association with a building of such romantic beauty as St. Mark's, not to speak of the other structures of world-wide fame contiguous. Taken by itself, and apart from these associations, it was unquestionably a somewhat ugly and clumsy erection, its chief architectural merit lying in the stern and rugged simplicity of the lofty stalk with its long vertical striations of pilasters. But we do not mean to imply that its loss to Venice is any the less. It had become so inseparably associated with the finest and most monumental portion of the "triumphant city" that one cannot feel that Venice can ever be the same without it; and to those who lived there and had seen it as a daily object of their lives we can well understand that the catastrophe must be almost heart-breaking. No attempt can be made to rebuild it; that would merely be a mockery.

Whether we shall ever have positive evidence as to the cause of the disaster is doubtful, as the fall has destroyed the evidence, unless the deep foundation may have any evidence to give of recent disturbance. In the Institute library is a paper in Italian by Signor Boni on the foundations of the tower, with a section, from which it appears that there was a carefully prepared foundation of stone blocks on the top of the inevitable piling, and we see that doubts are expressed in some quarters as to whether the mischief really lay with the foundations. Our own impression, however, is that the ground had probably moved below or with the piling, and that the state of the substratum of the soil of Venice is a matter for very serious consideration, in view of the safety of buildings even more precious than the Campanile. Considering what a thickness of soft and easily disturbed material must exist at Venice, between the ground surface and the uppermost firm stratum that can be arrived at, one can easily imagine how operations in dredging, and other disturbances of the ground, might cause a lateral movement of the subsoil, which would naturally make itself first felt under the heaviest structure. We may have some more information at a later date.

On the next page we give a view of the Campanile from the arcade of the Ducal Palace, from a water-colour sketch kindly lent to us by Mr. T. H. Watson.

The Campanile at Venice: from the Arcade of the Ducal Palace. From a Sketch made in 1864 by Mr. T. H. Watson, F.R.I.B.A.

(See preceding page.)

LIGHTNING CONDUCTORS.

SINCE Sir Oliver Lodge read his paper on "Lightning Conductors" to the Institution of Electrical Engineers, fourteen years ago, it may be questioned whether any considerable advance has been made in the theory of the methods of protecting buildings from damage by lightning. There has, however, been considerable progress made in applying the theoretical principles which he first clearly enunciated to the practical design of lightning conductors. The methodical measurements also of the electricity in the atmosphere, which have been made by careful observers for many years, are at last giving us some useful data. It has been proved, for example, that the earth's surface has a permanent negative charge, and that the upper regions of the atmosphere have a permanent positive charge. It has been observed that strong winds favour the dispersion of the electric charge, and also that a rise of temperature, a rise in the barometric pressure, or a rise in the humidity of the air, are all effective in dissipating differences of electric pressure. Sunlight accelerates the dispersion of a negative charge of electricity, and hence it also prevents electric storms. The invention of the coherer gives us a means of detecting storms at considerable distances, and M. Tommasina has invented an ingenious instrument founded on the properties of the newly-discovered element, radium, by means of which he has listened to storms taking place hundreds of miles away. It is thus possible, nowadays, to predict electric storms, and in the future it may be customary to take special precautions when a thunderstorm is threatening. This is already done in many towns of America to protect the plant in tramway stations from possible damage by lightning, the arresters which consume a considerable amount of power being put in the circuit only when a storm is threatening.

We have received from the General Electric Co., of Queen Victoria-street, a catalogue describing the air-to-earth system of lightning conductors devised by Mr. Killingworth Hedges, and it will be useful to consider how far this system is in accordance with theory, and to suggest possible developments in appliances for protecting buildings from lightning which may take place in the immediate future.

It will be remembered that in Lodge's paper great stress was laid on the difference of the action of lightning conductors when the difference of pressure between the cloud and earth was gradually established and when it was instantaneously attained. The latter was caused by a lightning discharge between two clouds suddenly altering the potential of one of them, so that it overflowed to earth; and in this case we have what Lodge calls an impulsive rush of electricity which severely tests the protective power of any system of lightning conductors. In the former case he proved that the silent brush discharge from points was energetic in equalising the electrical pressures, and so tending to prevent a lightning flash altogether. When a flash does happen under these circumstances, then it invariably strikes one of the points on the conductor, as the brush discharge produces electrified air in the neighbourhood of these points, which is a good conductor of electricity. Lodge, however, gives reasons for supposing that this kind of lightning flash is very rare, at least, in this country. Thunderstorms are nearly always accompanied by rain, and lightning flashes in the rain must be caused by a difference of pressure instantaneously established.

The functions which a lightning rod constructed according to modern theory has to fulfil are thus twofold—namely, producing an action which tends to prevent a lightning flash at all; and, secondly, it must be able to carry off an impulsive rush of electricity to earth. Many attempts have been made to measure the current produced in a lightning rod struck by a flash. It has been proved that the average current is something of the nature of 10,000 ampères, and that it attains its maximum value in something less than the ten-thousandth part of a second. It will be seen, then, that the inductive resistance of a lightning rod is of far greater importance than its ohmic resistance.

In Mr. Hedge's system we have horizontal conductors carrying points or clusters of points (aigrettes) at short distances apart, and they are all in electrical connexion with the vertical conductors. These points must be fairly effectual in preventing the differences of pressure ever becoming so great as to cause a lightning flash.

German statistics seem to prove that the erection of numerous lightning conductors in a town diminishes the annual number of lightning flashes, and it is well known that the cutting down of forests in certain districts has increased the number of thunderstorms in these districts. It seems natural to suppose that the pointed branches and leaves were active in preventing lightning flashes. The comparative immunity of districts thickly covered with fir-trees from damage by lightning could be explained in a similar way, the cones and needle-like leaves preventing large accumulations of electricity on the earth's surface.

It seems to us that in some cases it might be desirable to increase this electric discharge from the earth. It has been proved recently that the discharge from points in motion is very much greater than when they are at rest. Hence a small metallic windmill with points at the ends of its vanes on the roof of a building would be very effective in preventing dangerous differences of pressures. If necessary the vanes could be rotated mechanically or electrically on the approach of a storm.

Another method which seems to us quite feasible is to put some strongly radio-active body in contact with the lightning conductor. The effect would be to make all the air round the radio-active substance a conductor for electricity, and hence, not only produce rapid electrical discharges from the earth, but also, if there was a flash, it would naturally take place through the conducting air to the lightning conductor. The extraordinary effects produced by uranium, thorium, polonium, and especially radium, are now fairly well known to physicists; there seems to us to be no reason why inventors should not apply these properties to lightning conductors. There seems to be a wide field open for experiment in this direction.

We mentioned last year, when describing the lightning conductors designed by Mr. Hedges for Westminster Abbey, that it was an open question whether it was really advantageous to have them detached from the building or not. The holdfasts or clamps for keeping the conductor from the wall are of metal, and we suppose that they must be firmly fixed into the masonry. Might not the impulsive rush of electricity proceed along one of these clamps to some narrow metal strip in the neighbourhood? The more we consider the problem the more we think that it is unnecessary to support the conductor at some distance away from the building. If we had long electric wires or gas-pipes inside the building parallel to the lightning-rod, then it would be advisable not to have them too close together, owing to the danger of side flash, but we think that the requisite distance apart could always be got without the necessity of holding the conductor away from the wall.

The General Electric Co. point out that there are no screw threads or removable metal parts in the Hedges's system of lightning conductors. This is stated to be an advantage, as there is no danger of oxidation being set up by the loosening of the screws, and hence there is no danger of the resistance of the joint becoming so great that the lightning flash is diverted to some neighbouring conductor like a rain-water gutter or pipe and doing damage. It seems to us that this would be an infinitesimal advantage. The oxidation would only alter the ohmic resistance of the joint, the inductance would remain practically the same, and this latter factor is the all-important one.

Mr. Hedge's "tubular earth" is a very great improvement on the old-fashioned earth plates. The latter, when properly fixed, are quite satisfactory, but it is impossible to tell whether they are properly fixed or not without digging them up. We have measured the ohmic resistance between a lightning-conductor and a water-pipe, and found that it was only a few ohms, and yet the end of the lightning-conductor was only buried 3 ft. in dry soil and tied to a brick. It is only fair to add that it had protected a chimney shaft for many years quite satisfactorily. However, it does not do to leave anything to chance, and so we welcome the "tubular earth."

If a system of lightning conductors could be designed which would dissipate the earth charge so rapidly that it would be practically impossible for a lightning flash ever to occur between the building they protect and the clouds, it seems to us that this system would be by far the most desirable. With our present systems it seems impossible to absolutely protect any building from an impulsive discharge. We hope, therefore, that some physicist will suggest a method of utilising the power that radio-active substances possess of dissipating electric charges, to the protection of buildings from lightning strokes.

THE NEW DICTIONARY OF ARCHITECTURE.

THE new Dictionary of Architecture from across the Atlantic, to the first two volumes of which we have already referred, has been completed within a much shorter period than is usual in the case of publications of this kind, a fact which testifies to the business-like manner in which it has been con-

ducted. The third and concluding volume is now before us.* In the preface to the third volume the editor specially expresses his recognition of the manner in which the contributors have seconded him, observing that "The scheme of the Dictionary has never been disturbed or made difficult by any unwillingness on their part to conform to it." The Dictionary in itself is evidence of this, in the due proportion kept between the length of articles in comparison with the relative importance of their subjects. This, in too many cases, is one of the difficulties in the arrangement of a Dictionary, that many contributors on special subjects are so much interested in their subject, and have so much to say about it, that they are desirous of amplifying the article to a length and fulness of detail quite out of proportion to the general scope of the publication. We could name Dictionaries —Grove's "Dictionary of Music" for one— in which some subjects are treated at ten times the length accorded to others of equal or even more importance, showing plainly that some of the contributors had got quite out of hand. It needs, in fact, some firmness and personal power on the part of a Dictionary editor to prevent this; and while Mr. Sturgis thanks his contributors for their reasonableness, we may probably think that something of the result has been due also to his own firmness and decision.

Among the longer articles in the final volume of the Dictionary "Persian Architecture" is treated, for two out of the three sections into which it is divided, by Mr. Phené Spiers, than whom no one could be found more competent to deal with the subject. The third section, treating of Moslem architecture in Persia, is by an American contributor, Mr. A. D. F. Hamlin. "Romanesque Architecture" is in the competent hands of Mr. W. P. P. Longfellow, who gives a good definition of the subject, with a sufficient historical sketch and some typical illustrations of Romanesque detail. The important subject of "Roman Architecture" is again in the hands of Mr. Spiers. In the course of it he observes that the appliqué character of the decoration of the great Roman Thermæ was a necessity owing to the nature of the structural materials employed, and draws attention to the contrast which is to be found in comparing the palaces, temples, and baths of Rome with those in Syria, where quarries of excellent stone existed, and the core and face of the wails were homogeneous and constructed of the same materials. He rightly remarks that "to works of a purely utilitarian character, such as the great aqueducts which still exist across the Campagna of Rome, in the North of Africa, in Syria, and in Asia Minor, the Romans probably attached but little architectural importance." These aqueducts, which appear so picturesque to us now, were in fact, to those who built them, as purely engineering works as a railway viaduct is to a modern engineer. There are, he adds, a few instances, particularly in Rome where the aqueduct crosses a thoroughfare, in which the engineer has attempted to make a display by an application of the Orders, "and this as usual is unsatisfactory." In fact, the remains of the Roman aqueducts are among the best architectural object lessons as to the effect of a broad and simple treatment of construction without applied ornament.

"Russian Architecture" is briefly treated by the editor, and "Scotland" by Mr. Hamlin, whose aim is to illustrate the special characteristics of Scottish architecture in the Mediæval and Early Renaissance period, rightly concluding that "architecture as now practised in Scotland is in no essential different from that of England." "Sculpture" is treated at some length by the editor, from a point of view which includes such things as the carving of crockets and decorative ornament in mouldings, &c. It is perhaps rather a question whether work of this class is properly included under the term "sculpture," a word which, in common acceptation at all events, refers to a higher class of work. In regard to the state of sculpture in connexion with architecture at the present Mr. Sturgis, while saying that there has been no real progress in the way of architectural sculpture since the return of peace after the Napoleonic wars, seems nevertheless to imply that the English more than any other nation have produced work of new interest in architectural sculpture, but that "as there is but a feeble school of representative and expressional sculpture in England, this excellent work of their architectural sculptors has not obtained the influence over other nations that might well be desired." We should surmise that Mr. Sturgis is not much acquainted with the best English sculpture of the last ten years or so, or he would hardly have spoken of the school as being so feeble. French sculpture, at its best, is no doubt still at the head of all, and there is more of it than there is of English, owing in part to the far greater encouragement, public and private, which the art receives in France; but the best English sculpture of the present day is little behind the best of the French. As he says, however, of the French, their really great work in modern times has been in sculpture which, even if attached to buildings, has no necessary architectural connexion with them, but is merely, as it were, exhibited on brackets, &c., attached to the building. Some few, however, of the Paris mairies which have been occasionally illustrated in our pages during the last twenty years or so, have shown very fine examples of strictly architectural sculpture in the way of decorative figures on gables or pediments. At the present time the passion of the French in architectural sculpture seems to be for figures seated, as if accidentally, on the angles of cornices, &c., with their feet kicking over the edge; looking as if they were blown there by the wind, and might as easily be blown off again. There is a feeling of unrest about all this which is not in the true spirit of architectural sculpture.

"Stone" is treated in a good and full article by Mr. G. P. Merrill; "Temple," "Tower," and "Tomb" receive as adequate treatment as can be attained with the limits of a dictionary, "Vault" is an exceedingly good article by Mr. Charles Babcock, with a great number of diagrams of vaulting; and among other important articles are those on "Ventilation," by Mr. W. J. Baldwin; "Window," by the Editor and by Mr. La Farge—the latter treating of window glass at a length rather disproportionate to the architectural section of the article; and "Wood," by the Editor, from whom we get the information that "in the United States wood is hardly seasoned at all," with the natural results, which are referred to in the same sentence. This seems very characteristic of the American nature, which cannot wait, but must have everything in a hurry.

While however we welcome this as a very good and useful Dictionary of Architecture, which has been carried out with great ability and rapidity, there are some articles in it which appear to us to be out of the proper scope of a dictionary, and to have been inserted for the opportunity of expressing some opinions on various points of æsthetic criticism. "Preliminary Studies" is one of these. The meaning of the words is obvious to every one acquainted with the English language, and it is not the business of a dictionary to cover seven and a half columns with reflections on the proper value and use of preliminary studies in artistic work. A dictionary is to give information; this is not information, but art-criticism. "Refinements in Design" is another doubtful subject; it is not a technical term, and the article is here made use of to recommend the very doubtful views of some American critics in regard to the supposed variation from parallel and symmetry in mediæval and Renaissance buildings, for the sake of æsthetic effect. This idea, to the extent to which it is now pushed by its supporters, is a "hobby"; and hobbies have no proper place in a dictionary. "Restoration" has come to have such a technical meaning that perhaps its inclusion was justified, but a brief explanation of its general meaning was alone required, not an essay (even a short one) on the rights and wrongs of restoration. We can hardly agree, by the way, with Mr. Sturgis, that the influence of the French *Commission des Monuments Historiques* has been very beneficial. Some French artists, we know, are very strongly of the opposite opinion. The *Commission* has done valuable work in records and in a splendid series of illustrative drawings, but it has done great and irreparable injury to the archæological verity of many buildings. "Truth in Architecture" is another essay, by Mr. Marshall (the author of the one on "Preliminary Studies"), well written and thoughtful, but quite out of place in a dictionary.

Among small matters we may notice that under the head of "Porte-Cochère" a correction is made, which the Editor considers of sufficient importance for special reference in the Preface, as to the really incorrect use of this word in its application to a projecting carriage porch, originally made in England, but which it appears is copied in the States. "Porte-Cochère," as is rightly pointed out, is the name for the gateway *through* which the carriage drives into the central court-yard of a French house. The carriage porch, as used in England, is not a "porte," or doorway, but only an erection in front of the doorway. The word has been wrested from its original proper meaning, and the correction in the Dictionary is quite called for.

Taking it as a whole, in spite of our objection to some of the articles included, we may sincerely congratulate Mr. Russell Sturgis and his collaborators on the completion of what is in the main an admirable work.

* A Dictionary of Architecture and Building. By Russell Sturgis, A.M., Ph.D., and others. Vol. III.; O—Z. London; Macmillan & Co.: New York; The Macmillan Co. 1902.

NOTES.

Proposed Cape Town Exhibition.

A SCHEME for holding a British and Colonial Exhibition at Cape Town, for a period of four months from November, 1903, is, we hear, making good progress, and has the support of Lord Milner and other leading men in the Colony, as well as of the Cape Town Chamber. A site has been selected near the Botanical Gardens; the contract for the necessary buildings has been signed, and a very large number of applications for space have already been made. It is to be hoped that Home manufactures and Industries will be well represented. It will be to the interest of English firms to put in a good appearance, as they will now probably be able to find a considerable market in South Africa. The Cape Town management office is at 30, George-street, Cape Town; and the English address is Seymour-grove, Manchester.

Sculpture for the *Scotsman* Building.

MR. F. E. A. SCHENCK has had on view in his studio for a few days the finished clay models for some of the sculpture decoration for the new offices of the *Scotsman* newspaper at Edinburgh. The central crowning feature of the front is a *fronton* with a large niche, in which are grouped three draped female figures symbolising Peace, the centre one standing and filling nearly the height of the niche, the curve of which makes a kind of aureole round the head; the two others seated in such a position as to give them considerable projection from the wall plane. Having to occupy a position more than 90 ft. from the ground, they are necessarily treated in a very simple and bold manner. The *fronton* is finished by an obelisk, with which are grouped two very graceful nude figures of youths. Over two of the pediments of the windows in a lower portion of the elevation there are back-to-back nude female figures, one on each slope of the pediment; these are modelled on very bold lines, admirably designed for the space they are to occupy, but at the same time kept slightly flattened in section and undercut behind. As decorative architectural sculpture these pediment figures are most effective, and are among the best things of the kind which Mr. Schenck has produced.

The Bristol Electric Tramways.

THE paper on "The Bristol Tramways Electrical Installation," read to the Incorporated Association of Municipal and County Engineers by Mr. J. Clifton Robinson last week, gives a clear account of the main features of a thoroughly up-to-date traction power station. Owing to the rapid extension of the system, large plant had to be installed in a building on a very limited site. The unusual course was adopted of putting the boilers and furnaces in the floor above the engine-room, as it was desirable that the engines and dynamos should be on the ground floor. The handling of the coal, the stoking, and the removal of the ashes are practically all done automatically, the grab-bucket being capable of raising 60 tons per hour from the barges. The dynamos have been constructed by the General Electric Co. of America, and they are direct-driven by American engines. As the speed of the engines is only ninety revolutions per minute, very heavy flywheels are necessary in order to secure steady running. These flywheels are 16 ft. in diameter and weigh 40 tons each, hence even a heavy variation in the load makes very little difference in the speed of the engines. The people of Bristol evidently appreciate the transit facilities offered by the tramways. In 1900, when only parts of the system were worked electrically, 27 million passengers were carried, whilst in 1901, when the system was completed, 37 million passengers were carried.

Chartley Castle, Staffordshire.

THIS estate, which extends over some 8,000 acres, yielding a rental computed at about 11,000*l.* per annum, is offered for sale by private treaty. It comprises a natural park of 1,000 acres, famed for its indigenous breed of wild white cattle—a stock that is descended from the primeval herds of Needwood Forest—the ruins of Chartley Castle, and Chartley Hall, a seat of the Shirleys, Earls Ferrers. The Hall, a moated house after the Domestic Gothic style, contains a room which had been a prison-lodging of Mary Queen of Scots, but much of the house has been consumed by fire on two occasions since that time. On an eminence close by stand the remains, consisting of two ivy-covered round towers surrounded by yew trees, of the Castle, which Randolph de Blundeville, fourth Earl of Chester, built in 1229 upon his return from the Holy Land. Earl Randolph died *s.p.*, his sister brought the Staffordshire estates in marriage to William de Ferrers, Earl of Derby, ancestor of John, who was summoned to Parliament as Baron Ferrers of Chartley in 1299, of Sir Walter Devereux, K.G., who fell on Bosworth Field, and of Sir Robert Shirley, Baron Ferrers, who in 1711 was advanced Viscount Tamworth and Earl Ferrers. The Castle, which Robert de Ferrers, eighth and last Earl of Derby, forfeited on his attainder in the reign of King John, was subsequently restored to that family. It was replaced, as a residence, by a house constructed mainly of wood and destroyed by fire in 1781, which formed the home of the Earls of Essex (Devereux). In 1615, Dorothy, daughter of Robert, Queen Elizabeth's unfortunate favourite, married Sir Henry Shirley. In the parish church of Stowe is the altar tomb with effigies of himself and the two wives of a later Walter Devereux, K.G., tenth Baron Ferrers and first Viscount Hereford, *obiit* 1558, who greatly distinguished himself in the wars with France.

ARCHITECTURE AT THE ROYAL ACADEMY:

FINAL NOTES.

THERE are comparatively few examples in the present Academy of designs for public buildings and competition drawings.

No. 1,365. "Shoreditch Town Hall," Old-street, by Mr. William G. Hunt, shows the additions which are being carried out in consonance with the older building, from the designs of the architect, who was successful in the open competition.

No. 1,367. "Club House for Halifax Golf Club," by Messrs. J. F. Walsh and G. Nicholas, is a picturesque design shown in a clever drawing of a building raised on a terrace, with a pleasant and not extravagant formal garden treatment.

No. 1,368. "New Police Station in Hyde Park," by Mr. John D. Butler, is almost domestic in treatment, following what one may call the old Kensington type, and is one of the most successful of the many police stations which are being erected in London from this architect's designs.

No. 1,371. "Public Library, Holbeck, Leeds." First premiated design by Mr. William Bakewell, is a good modern type of design in which utility is combined with art withou extravagance.

No. 1,372. "New Gaiety Theatre and Restaurant," Strand, by Messrs. Ernest Runtz & Co., differs considerably from the design submitted by the authors in the abortive competition promoted by the London County Council, and evidently owes much of its difference from the former design to the influence of Mr. Norman Shaw. Some good points of the original design have vanished, and which is the better of the two is a matter of taste on which there is room for a legitimate difference of opinion.

No. 1,373. "New Banking Premises," Sunderland, by Mr. Walter H. Brierley, is an example of the usually accepted mode in bank design, solid and respectable in its classicality.

No. 1,378. "Design for Font and Decoration," by Mr. George J. J. Lacy, is one of the lesser examples of ecclesiastical design shown in a coloured drawing. in which the feeling of fifteenth century Gothic work is cleverly amalgamated with that of the new art.

No. 1,385. "New Head Offices for Elder, Dempster, & Co., Liverpool," by Messrs. Briggs & Wolstenholme, is an example of commercial architecture, ornate and somewhat pretentious.

No. 1,404. "The Shannon Factory, Dalston," by Mr. Edwin O. Sachs, is a good example of the successful artistic treatment of a factory which, without extravagance, elevates a purely utilitarian structure from the domain of mere building to the level of architecture.

No. 1,420. "Design for a Public School," by Mr. Horace C. Hide, is the Royal Academy Gold Medal and Travelling Studentship design for 1899, which, though in sympathy with the work of an architect R.A., cannot be said to be so successful as bygone treatments of a similar subject in the annals of the R.A. Gold Medal.

No. 1,423. "St. Paul's School for Girls—the Central Hall," by Mr. Gerald C. Horsley, is an interior view of which the chief feature is a large elliptical ceiling, richly decorated.

No. 1,427. "Design for Manchester Fire Station," by Messrs. Lanchester, Stewart, & Rickards, is one of the few competition designs exhibited, and cannot be said to be one of the most successful which these architects have produced.

No. 1,437. "Business Premises, Bombay," by Messrs. John Cash & M. S. Hack, is a somewhat original design with a clearly indicated Spanish feeling in the detail, and gains much in effect from the deep arcades and loggia which the climate justifies, and we might say necessitates.

No. 1,448. "Detail of the Central Electric Supply Company's Power Station, Grove-road," by Mr. Charles S. Peach, is another example of artistic factory treatment with a bold attempt at a solution of the problem of tall chimney design sought in this instance by dressing up with architectural detail of a purely extraneous character.

No. 1,462. "Liberal Club, New Ferry, Cheshire," by Mr. John J. Talbot, is a simple and quite satisfactory instance of eighteenth century treatment — picturesque without extravagance.

No. 1,476. "School of Domestic Training, Colwall," by Mr. Frederick W. Catterall, is remarkable for its picturesque grouping, and also, in common with other victims, for its position as a delicate drawing on the skirting.

No. 1,482. "A Design for the Hereford Municipal Buildings," by Mr. E. J. Milner Allen, is refined, dignified, and scholarly.

No. 1,484. "Clare House, Beckenham, Kent," by Messrs. Karslake & Forrester," appears to be a school house of the private-public kind, noticeable in design for its picturesque and quaintly irregular grouping.

No. 1,502. "Electric Station, &c., on the Severn," by Mr. George Hornblower, is another example of an artistic factory in which advantage is taken of a situation on the rocky banks of the stream, by which, combined with clever grouping and good proportion, an architectural effect is produced, without the employment of other than strictly utilitarian detail.

No. 1,505. "The 'Lord Nelson,' Ewell," by Mr. J. Hatchard Smith, is a clever resuscitation of the old world wayside country public-house.

No. 1,519 "Queen's Memorial, Spring-gardens Approach," by Sir Thomas Drew, is a good drawing of one of the best parts of this architect's design.

No. 1,527. "Extension of the Stock Exchange, London," by Mr. Robert L. Cole, is an interior view showing maintenance of the character to be seen in the detail of the former work.

No. 1,530. "Reformed Church, Rorschach, Switzerland," by Mr. Alex. Koch, is an ornate example of modern Continental Gothic.

No. 1,548. "West Riding Union Bank, Park-road, Leeds," by Messrs. Oliver & Dodgshun, departs from the usual treatment of bank buildings, certainly without success, owing to over-ornamentation and unhappy proportion.

No. 1,555. "New Offices at Newcastle-on-Tyne," by Messrs. Joseph Oswald & Sons, is an extravagantly florid design, which would very probably look better in execution than in the drawing.

No. 1,556. "Consumption Sanatorium, Delamere Forest, Cheshire: View of Main Building," by Mr. W. Cecil Hardisty, is a successful attempt to avoid the monotony usual in hospital buildings and to produce an artistic effect.

No. 1,559. "Four Houses and Shops, High-street, Oxford," by Mr. E. P. Warren, is a clever effort to deal with the problem of shop design.

No. 1,567. "Covered Market and Corn Exchange, Hull," by Mr. Joseph H. Hirst, is modern, sensible, and admirable, good in proportion, and free from extravagance in detail.

No. 1,568. "Restaurant and Club, Stratford," by Mr. S. B. Russell, is a clever design for a street frontage, full of originality and interest.

No. 1,572. "Design for Hereford Municipal Buildings," by Messrs. Cranfield & Potter, is a good design for a front elevation.

No. 1,576. "Design for Burnley Technical Institute," by Mr. William H. Thorp, is an admirable design, well grouped and proportioned, with good detail.

No. 1,578. "Keighley Library, Main Entrance," by Messrs. A. E. McKewan & F. Swan, is a clever piece of detail based on seventeenth-century work, and with many quaint conceits justified by the particular period selected.

No. 1,579. "Mount Vernon Hospital for Consumption, country branch, Northwood, south block," by Mr. Frederick Wheeler, is another capital hospital design, showing two wings placed at an obtuse angle with a central tower.

No. 1,582. "St. Felix Schools, Southwold," by Mr. Arnold Mitchell, is a large school on the house system, the design of which, although following a simple type of eighteenth-century work, has some eccentric bits of detail which are not admirable.

Interspersed amongst the architectural drawings are, as usual, a number of designs of stained glass, as to which one can never be quite sure that the coloured drawing represents with even an approximate accuracy the effect of the finished work.

Nos. 1,393 and 1,400 are designs for respectively the east window and the west window of Christ Church, Waterloo, Liverpool, by Messrs. Shrigley & Hunt, and are large and rich examples, containing many figures and canopy work in which is much white glass in perpendicular tracery windows.

No. 1,397. "Design for Stained Glass," by Mr. George Parlby, is an instance of a distinctly different treatment of pictorial character in one semicircular headed light, and is hung next to

No. 1,395. "Design for a Child's Memorial Window," by Mr. Wm. Aikman, in a three-light decorated tracery window, which is filled with glass of a modern type, in which much is made of the forms enclosed by the lead cames. The examples of stained glass design seem, indeed, to have been chosen with a view to illustrating the varied standpoints from which a window can be treated. Thus, in

No. 1,455. "Design for Stained Glass," by Mr William Glasby, we have an example of a mosaic type of treatment, whilst in

No. 1,464. "Design for Window, Morley Town Hall, Yorks," by Mr. E. Stanley Watkins, we are shown an instance of the grisaille method of treatment.

No. 1,487. "St. Lawrence: Design for Stained Glass," by Mr. Robert Hancock, shows the figure of the saint with canopy work around, and is noticeable for the fine colour in the figure, combined with much white glass in the canopy. Quite near to this is

No. 1,494. "Design for Painted Glass Window," by Mr. Alexander Gascoyne, an example of painted glass commemorating the legend of Perseus, quite an antithesis both in subject and treatment to the last.

No. 1,496. Another "Design for Stained Glass," by Mr. Alexander Gascoyne, shows a figure of St. Hugh treated in the fifteenth-century manner.

No. 1,520. Another of Mr. Gascoyne's works is a "Design for Memorial Window," which has the "Ecce Homo" for the subject, and

No. 1,521. Design for leaded glass mosaic, also by Mr. Gascoyne, is a secular subject, "Gather Ye Rosebuds"; both of these last may be correctly described as examples of glass mosaic of modern type.

ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

THE annual meeting of the Association of Municipal and County Engineers was held in the Lecture Theatre of the Museum, Bristol, on Thursday, July 10, Mr. T. H. Yabbicom, C.E., of Bristol, President, in the chair.

Tramways.

Following the Presidential address, and a paper by Mr. Yabbicom on "Twenty-five Years of Municipal work in Bristol," reported in the last issue of the *Builder*,

Mr. C. F. Wike, C.E., City Engineer of Sheffield, contributed a paper on "The Wear and Maintenance of Tramways." He said that for some time observations had been made of the wear of the permanent way of the Sheffield tramways, and the broad results were as follows:—Length of tramways authorised was eighty-nine miles of single track, of which, up to March 25 last, fifty miles had been constructed. The rails were of girder type, 7½ in. wide on the flange, and 7 in. deep. The weight was 108 lbs. to the yard. Up to the present the rails had been rolled in 30-ft. lengths, but the most recent order provided for a length of 45 ft. The width of tread was $1\frac{1}{16}$ in., and the depth of groove was $\frac{1}{16}$ in. There was a clearance of $\frac{7}{16}$ in. between the lowest point of the wheel-flange and the bottom of the groove, and it was considered that when the rails had worn sufficiently to enable the flange to touch the bottom of the groove then their life would be at an end. Before this could happen a sectional area of 0·706 in. of steel must be worn away. Observations had from time to time been taken to ascertain the rate of wear upon the rails, and the results showed that the wear was regulated more by the gradient than by the number of journeys, the reason for this being that the action of the brakes was far more destructive than the uphill traction. The reduction of depth of groove varied from 0·03 in. to 0·25 in.

So far as permanent way was concerned, the points and crossings appeared to be one of the matters most in need of improvement. Several types had been put down in Sheffield, mostly of British make, but as an experiment some American points had also been tried. In these a special metal was introduced for the parts subject to the greatest wear. It was more difficult to give data as to the wear of points and crossings than as to the wear of rails, because the conditions under which the points were used vary in nearly every case. Various forms of pavement had been laid, including granite, wood and gritstone setts, a Scotch Basalt or Whinstone, and also tar macadam with a single row of setts adjoining each rail. Several miles of the latter paving were laid, largely as an experiment, and the experience has been such that a repetition was improbable; in fact, a long length of track on one of the main suburban roads had worn so rapidly that it was now proposed to replace the tar macadam track with setts. Records had been kept of the cost of maintenance and renewals, and these have been reduced to an average cost per mile per year for each type of paving. The figures for average cost of maintenance (not renewal) per mile per annum, single track, were: granite, 19*l.* 13s. 6d.; granite paved tracks, macadam sides, 47*l.* 9s. 6d.; gritstone, 49*l.* 11s.; wood paving, 54*l.* 8s. 3d.; tar macadam, hit-and-miss setts against rails, 64*l.* 13s. 3d.

Mr. Paton, Plymouth, moved a vote of thanks to Mr. Wike. He said electric traction was comparatively new, and he doubted very much if in any town sufficient experience had been obtained to guide local authorities as to the exact amount to be put aside for depreciation.

Mr. Brodie, Liverpool, in seconding the vote of thanks, warned engineers against skimping maintenance and depreciation charges. In Liverpool they put in everything done every year as maintenance, and a minimum of 30,000*l.* a year over and above that for depreciation.

Mr. Mawbey (Leicester), Mr. White (Hull), Mr. Yates (Waterloo), and Mr. Collins (Norwich), took part in a short discussion, and the vote of thanks was passed.

Underground Conveniences.

Mr. J. Rush Dixon, A.M.Inst.C.E., Engineer and Surveyor, Shoreditch, then read a paper on "Underground Conveniences." He said it would be generally admitted that these underground structures were a great sanitary acquisition and improvement over the older-fashioned wood or cast-iron above-ground kiosks, which were more or less unbecoming, and were such an obstruction in busy thoroughfares, besides having proved themselves to be favourite resorts of pickpockets when not under the immediate surveillance of an attendant. The proportionate requirements of the female sex were hardly recognised hitherto, as evidenced by their reticence when provision was first made for them, but that had now given way to such appreciable usage that the women's sections were now almost as largely patronised as the portions arranged for men. In his opinion, a perfectly ventilated convenience was something which had yet to be attained. Their position underground accounted principally for this, of course, and the condition was not assisted by the ever-varying humours of our climate. A humid outside atmosphere had such an effect inside many of the conveniences in London that they become positively offensive, and no amount of swilling-out with scented deodorants could keep down the bad smell. The usual methods of inducing a constant current were by arranging for wall-openings to be left where possible all round the interior just under the roof, which space was continued in the form of a grated duct to communicate with the surface above. Given a proper disposition of the stairways this arrangement was about the best that had yet been devised. Fair results were in some cases got by ventilating columns with large perforated bases being placed on the roof. Automatic water-driven fans were also largely used, and these certainly displace the air surrounding them and assist in establishing a current. The water was further utilised by connexion to flushing cisterns. That the provisions of these structures would, in the true sense of the word, be a convenience for the general public was sometimes made a subservient factor by their representative Councillors, the question they mainly consider being whether such a place would be a source of profit over and above the cost of maintenance, administration, and annual charge of repayment and interest where a loan had to be taken up. But even allowing for these and losing sight of the fact that a valuable property was gradually being redeemed, the receipts from conveniences in an average busy district sometimes prove them to be fairly remunerative institutions; indeed, some of the best-known sanitary engineering firms were disposed to construct and undertake their up-keep and working in certain selected places, and to pay to the respective Local Authorities an annual sum for the privilege, thus ensuring no loss for the rates to bear. The practice was, of course, to be deprecated, and in any case they should try to impress on their employers that these structures were conveniences for the public rather than mere profit-earning institutions.

Mr. Nettleton, Weston-super-Mare, said the lavatory accommodation at Weston was inadequate, but with underground conveniences they had the difficulty of having the surface water within 3 ft. or 4 ft. of the surface, and not having sewers sufficiently deep. One firm had offered to supply an apparatus for raising the sewage of one of these conveniences about 5 ft. for 200*l.*

Mr. W. Weaver, Kensington, in moving a vote of thanks, considered that these underground conveniences, like most sanitary works, were likely to be overdone. Underground conveniences were started as an economical and paying venture, and in many busy thoroughfares of London they formed a profitable item to the ratepayers. But suburban districts, imitative of their brethren in the more central districts, had gone in lavishly for these conveniences in districts where the revenue could not recoup the outlay, and it behoved the

authorities to see that in their enthusiasm for these conveniences they did not put 2d. or 3d. on the rates.

Mr. Winter, Hampstead, said he did not agree that thirty years was an unreasonable period for the Local Government Board to sanction a loan for such purposes. He had provided a free water-closet for poor persons, and there had been little trouble with them, and very little abuse. In small districts, where expense was a consideration, considerable saving might be effected by using more concrete and less brickwork. In fact, concrete altogether, faced with Doulton concrete tile, was fairly pleasing to look at, and much cheaper than a construction of 14 in. or 18 in. of brickwork.

Mr. A. E. Collins, Norwich, said there seemed to be a charm in these underground conveniences to some people. He thought that an overground convenience, architecturally treated, need not be an eyesore, and could be provided at a much smaller cost.

Mr. J. Lemon, Southampton, entered his protest against the Council of Shoreditch and other places in London charging a poor woman a halfpenny for the use of a urinette, when no charge was made to a man. Was it not time that they had ladies on Town and District Councils to enable them to legislate against that sort of thing?

Mr. W. Nisbet Blair, St. Pancras, mentioned that in St. Pancras he had proved that it was more economical to rent a small shop than to build one of these underground conveniences. On the one side there was an entrance for men with a small tobacco store, and on the other side an entrance for women to a small store of women's fancy articles or sweets. He admitted that the system of underground conveniences was being ridiculously overdone. An abuse of the free closet which he might mention was the use of the water spray by women selling flowers in the streets to revive their blooms.

Mr. Lacey, Oswestry, said there was no doubt that conveniences constructed above ground were much cheaper than below ground. He had just constructed a convenience with stone outside and bricks inside, containing five circular backed urinals and three water-closets, which worked out at a cost per cube foot of 1s. 1½d.

Mr. W. Harpur, Cardiff, thought there was a good deal in the suggestion of Mr. Blair, and he had started to look out for suitable premises in Cardiff. He thought with a tobacco-store on one side and a sweet shop on the other, ladies would have less objection to entering than they had the present underground conveniences.

Mr. E. G. Mawbey, Leicester, mentioned that they had put up a small place opposite the Town Hall which had proved a great boon to females.

Mr. Brodie, Liverpool, said they had tried a similar thing in Liverpool and it had not proved a success. Then there was such a thing as paying away in rent what they were saving in capital expenditure.

Mr. Dixon, in replying to the discussion, said they had not built conveniences in Shoreditch until they had received petitions asking for such conveniences to be provided. The cost was something like 3s. per cube foot.

Continuous Sewage Filters.

Mr. F. Wallis Stoddart, F.I.C., F.C.S., then read a paper entitled "Some Points in the Construction of the Continuous Sewage Filter." He said that during the past two years a considerable number of continuous filters had been erected, and as the actual construction had in all cases been left in the hands of the several engineers concerned, a large body of experience had accumulated with regard to the original form of the filter, and to such modifications as had suggested themselves in practice. The main principle underlying this type of filter was the preservation of the interstices of the filter as air spaces in the freest possible communication with the external atmosphere. There was evidence of some weight to show that the ventilating currents essential for providing the necessary supply of oxygen follow closely the course of the liquid applied to the filter, and that the vertical continuity of the air spaces was of more importance than the horizontal; from which it followed that there must be no hindrance to the access of air to the surface and base of the filter. Experience proved, indeed, that whilst no appreciable difference could be detected in practice between a filter wholly open at the sides, and one so enclosed as to leave the base only in communication with the air, complete closure of the sides and base of the filter (with the exception, of course, of an outlet for the effluent) resulted in a total cessation of its oxidising action. This apparatus was fully described by their President at last year's conference, but in order to correct a widespread error in its mode of application, it was necessary to recall that it consisted of a number of narrow gutters inserted at both ends into specially designed channels which both feed and supply them. The whole of this system must be laid perfectly level, no fall whatever in the supply channels being required. The escape of liquid from the distributors was so free and unimpeded that with the maximum flow along the channels no measurable rise in level was apparent. There were two matters connected with the use rather than the construction of this filter which might be usefully mentioned. It was surprisingly rare to find sewage works with an efficient means of gauging the flow, and the trifling display made by the drops of liquid falling from the points of the distributor was so deceptive that these filters were commonly, though unintentionally, much overworked. It should be remembered that one drop per second from each point was equivalent to a flow of twenty-two gallons per hour per square yard, the full dose for a 3 ft. filter; and that, assuming that only one-fourth of the points was working, each should deliver only four drops per second. It was almost impossible without direct measurement to persuade the inexperienced observer that the total flow was so considerable. Secondly, it had been pointed out elsewhere that a dilute tank effluent was more amenable to treatment than a strong one, because the additional water provided means of applying more dissolved oxygen to the oxidisable impurities. In many localities there must be a considerable quantity of more or less polluted and useless subsoil water, the removal of which from the neighbourhood of dwellings would add to their healthiness, and which at small expense could be brought into the works and there added to the tank effluent before its application to the filter. By thus increasing the total volume to about fifty gallons per head of population, the oxidation of the organic impurities would be greatly facilitated.

Mr. E. J. Silcock, Leeds, moved a vote of thanks to Mr. Stoddart for his paper. He was glad to find that Mr. Stoddart was so impressed with the proper aëration of the bottom portion of the filter. The method of filtration adopted in some places was to have a perforated bottom. It appeared to him in that way a more perfect aëration was obtained than in the construction shown in this filter. Mr. Stoddart gave a flow of 2½ million gallons of sewage per acre in twenty-four hours for a 3-ft. filter. He had never seen a filter working at that rate which was only 3 ft. deep. Mr. Stoddart had told him that the cost of the filter varied from 10s. to 20s. per square yard, according to the size of the filter. The cost was a very important item, and could only be justified by obtaining results superior to results obtained in other ways. If, however, Mr. Stoddart could guarantee an efficiency of 2 to 2½ million gallons of sewage per acre, they would not quarrel about the price.

Mr. Lacey, Oswestry, seconded the vote of thanks. He said every one who had to do with bacterial treatment would welcome any light on the subject, because there were many difficulties to be faced. He did not agree with Mr. Stoddart that a filter composed of ¾-in. clinker became ineffective in seven months. His beds were composed of cinders of from ½ in. to 14 in., and they did not find them become ineffective in so short a time as seven months. There was no doubt with this type of filter there must be plenty of aëration.

Mr. MacBrair, Lincoln, said he had seen the filter at work that morning, and must confess that the effluent was hardly of that purity they had hoped and expected to see.

Mr. Hall, Cheltenham, said he found with somewhat similar treatment they had to put the effluent over land. He should not consider any effluent he had seen from a continuous filter fit to go into a stream.

Mr. Cotterell, Bristol, said he could bear testimony to the amount of attention to detail given by Mr. Stoddart to the production of a better form of filter than what formerly existed. The form of distributor used made the filter work over its whole area and depth, and the method of passing the liquid drop by drop gave a larger amount of purification per square yard by this method than by any other means he knew of.

Mr. Stoddart, in reply, said the only objection to the perforated bottom suggested by Mr. Silcock was the expense of construction. With regard to the rate of flow there was no difficulty in dealing with the quantity he had stated. As regarded the closing up of a continuous filter as compared with a contact bed, he thought the advantage lay with the filter, because the constant and copious flow tended to clear away the intercepting solids.

Mr. Lacey asked the average chemical purification.

Mr. Stoddart said it was 70 per cent. on the tank effluent. In reply to Mr. MacBrair, he might say that the effluent from any continuous filter always contained suspended solids, otherwise the filter was not sufficiently open to effect aëration; but they were readily separated by a catch-pit. In reply to Mr. Hall, he might say he preferred a catch-pit to passing the effluent over land, though the effect of vegetation was exceptionally good.

The meeting then adjourned.

The proceedings were resumed in the Lecture Theatre of the Museum on Friday, Mr. T. H. Yabbicom, C.E., in the chair.

Motor Vehicles.

Mr. E. Manville, M.Inst.C.E., said that there were great possibilities for the self-propelled vehicle in connexion with borough and county work few would deny, but it was doubtful whether the full extent of the numerous purposes to which it could be put was fully realised at the present moment, for, unfortunately, but few really serious attempts had so far been made to utilise the new form of locomotion in this direction. Up to the present some of the more enlightened local authorities had organised services for street watering and dust collection by means of motor vehicles, and, moreover, some attempt had been made in one or two cities to employ the motor in connexion with fire-brigade work. The scope of the automobile was so far-reaching that these experiments were comparatively insignificant and give but the slightest idea as to the great results eventually to be secured. The design and construction of the self-propelled vehicle had to-day reached a standard of excellence which rendered it eminently suited to all classes of work, and serious consideration should be given to the claims put forward on its behalf. The main questions were economy and reliability of running, and, perfected as it now was, the motor vehicle embodied both qualities to a very marked degree. Cars such as the Daimler—one of the best known existing types—for years past had been running week after week and month after month at a cost of fuel of ¾d. per mile. Good results, however, were only to be secured by the employment of a thoroughly capable mechanic. No greater mistake could be made than to commit to an inexperienced man the charge of a motor vehicle, and no doubt many had false impressions as to the cost of maintenance of motor vehicles owing to the repairs that had been necessitated by the absence of intelligent care on the part of the individual whose duty it was to clean and adjust the somewhat delicate mechanism of the car.

Mr. E. G. Mawbey, Leicester, moved a vote of thanks to the author. He warned engineers against purchasing a cheap car. To have anything less than 8 h.-p., and costing less than 400*l.* was a mistake.

Mr. W. Weaver, Kensington, said he had a Thorneycroft steam-propelled car for street work for five months. It consisted of a tank of 600 gallons with two water distributors—one for flooding a road and the other for fine distribution. In addition, it could be fitted with a rotary brush or spiral india-rubber squeegee for cleansing purposes. It worked all right in washing and cleansing wood pavement, and would do 140,000 sq. yds. an hour. With two of these vehicles he hoped to save his entire staff of night horses and men.

Mr. Winter, Hampstead, said he had had two Thorneycroft steam-motors at work for nine months. They were obtained for dust collection, but so much time was lost in collection that they were not economical. He had since used them for watering and haulage purposes, and even allowing liberally for repairs and depreciation there was a saving compared to horses.

Flooding in Bristol.

Mr. W. J. Steele, Assoc.M.Inst.C.E., Deputy City Engineer, said the prevention of flooding in Bristol had been a source of anxious thought to the City Council for several years, and whilst much had been done to alleviate the danger, it could not, perhaps, be claimed that the task was completed. The Corporation were Conservators to the Port and Harbour of Bristol, extending from Hanham Mills on the River Avon to the mouth of such river at King's Road, a distance of about fourteen miles, and thence down the River Severn and the Bristol Channel, from King's Road westward to the islands called the Steep Holmes and the Flat Holmes, an additional distance of about twenty miles. They were also Conservators of the rivers and brooks within the port, which were under the control of the Docks Engineer, Mr. W. W. Squire, M.Inst.C.E. During the last fourteen years the Council had spent over 132,000*l.* in works of flood prevention, so that it would be seen the question had been treated in an earnest manner and with considerable success, since the former disastrous effects of heavy rainfalls had been very greatly reduced, as shown by the fact that in 1894 and 1900 very small areas were flooded—and these by the Cutlers Mills brook and Boiling Wells stream—although the rainfall was nearly equal to that in 1882 and 1889, when large and densely populated areas were submerged, causing widespread loss and suffering.

Mr. Smith, Dartmouth, speaking as an old Bristolian, congratulated the city upon the success of the floods prevention works.

Hospital, Ham Green, Bristol.

Mr. Herbert W. Harding, chief architectural and engineering assistant to the City Engineer, said that three years ago the Corporation of Bristol opened their hospital at Ham Green, but it was soon found that the accommodation provided was inadequate to meet the requirements of the extended city, and it was resolved to erect additional buildings on the same site. The accommodation to be provided included a double-decker pavilion, observation pavilion, discharging block, additional wing to the original administration building, water storage tank and tower. The double-decker pavilion had been designed to accommodate fifty beds, and was to be erected upon a piece of ground to the west of the present pavilions. The observation pavilion accommodated eight beds and was divided into two sections, for males and females respectively, each section being isolated from the other with separate entrances facing east and west, and containing two one-bed wards, 13 ft. by 12 ft. by 13 ft., and one two-bed ward, 24 ft. by 13 ft. by 13 ft. The pavilion was intended for the reception of cases requiring special observation to enable the medical officer properly to diagnose a case before drafting it into the fever pavilion.

Mr. Harpur, Cardiff, moved a vote of thanks to the author of the paper, which was carried.

Sea Mills Sewage Disposal Works.

Mr. A. P. I. Cotterell gave a description of the Sea Mills sewage disposal works. He said the works were designed to replace a sewage farm in another part of the district that had become insufficient, and was badly situated. They were also constructed to treat the sewage from Stoke Bishop that formerly ran direct into the River Avon. The works were placed about a quarter of a mile from the River Avon in a narrow valley cut through the dolomitic conglomerate, portions of the tanks being founded upon the solid rock, and portions upon the alluvial soil with which the bottom of the valley was filled. They were designed to accommodate a population of 10,000, the present population being nearly 7,000, and were so arranged that extensions upon the same lines might be made up to a population of 30,000. The effluent discharges by a brick culvert 3 ft. 6 in. by 2 ft. 4 in. internal dimensions into the tidal portion of the River Avon at a point below low-water; but the Local Government Board, in giving their sanction, required the Barton Regis Rural District Council to discharge only at certain states of the tide, viz., between high-water and an hour and a half before low-water. They stipulated that the sewage should be capable of being treated with chemicals, and after such treatment, together with subsidence in tanks, should be stored, except during the hours above-stated. The works partake in many particulars of the usual features common to such installations, but there were two points of interest to which attention might be drawn. The first was the automatic discharge controlled by a clock. This clock was the joint invention of Mr. A. M. Hunt and Messrs. Kemp Brothers, on suggestions made by himself. It was designed upon the alarum principle, with five faces, and was so arranged that it actuated the penstock both for opening and closing twice in every day. The hydraulic accumulator contained sufficient water for four actions of the penstock. It was charged each day by the attendant, who, at the same time, set the clock for the two tide-discharges of the day, and who need not trouble any more about this part of the works. The periods of discharge were adjusted to correspond as closely as possible with the periods of the tide table.

The other point of interest was the scraper placed in each septic tank. It ran upon iron guides and was drawn to and fro by a wire rope passing, by means of sheaves at the ends and top of the tank, round a drum driven by belting from the gas-engine. The speed of the scraper was a little under 2 ft. per minute, and the gearing of the drum was so arranged that the scraper could overwind, but immediately it reached the end of the tank, a weight, working on a horizontal screw, threw the gearing out and the scraper remained stationary until the attendant reversed the apparatus.

The visits of the members included the Sea Mills sewage works, the electric power stations, the destructors, the water company's reservoirs at Blagdon, and the new docks at Avonmouth. The meeting was in every respect a complete success.

ARCHITECTURAL ASSOCIATION SUMMER VISITS.

The third summer visit of the Architectural Association took place on Saturday last, July 12, to Haslemere, to inspect the very picturesque and artistic house, New Place, the residence of Mr. and Mrs. A. M. Methuen, as a typical specimen of the work of Mr. C. F. A. Voysey.

The site of the house, built on an extremely steep hillside, is of many levels, and had to be made by excavation, and filling up, the result being the formation of a series of very beautiful gardens and enclosures, designed, in conjunction with the house, to form a complete scheme. Certainly the result is entirely successful, possessing in its environment of rich Surrey scenery much similarity to an Italian garden.

The house is planned to give a large entrance hall on what may be termed the upper ground floor, the dining-room, drawing-room, library, and other apartments leading directly from it, whilst the billiard-room and offices are below; and on the first floor are a series of extremely well designed and decorated bedrooms, carried out very characteristically by Mr. Voysey, who throughout the house seems to have designed not only the great majority of the articles of furniture, but the carpets and hangings also, even to the cast-iron ventilating gratings. Certainly it has seldom fallen to the lot of the members to inspect a building that has been designed and detailed in such a thorough manner. The interior is so very full of simple well-studied designs and properly-placed ornament that there is not sufficient space here to describe them all. The principal staircase, with its long, slender, square balusters and delicate details in mouldings, &c., was much admired; the fireplaces throughout, often of very large size, with polished brass and copper grates and fenders, and with displays of colour made either by fire tiles, bricks, or choice marbles, formed a remarkable series of designs; many extremely useful ideas in planning, and the using up of odd spaces, were carefully noticed.

The exterior of the house is finished in rough cast, either thinly plastered in the North country manner, or thickly lime-whited, and has for roof coverings small green slates graduated from the ridge downwards. Stone is used for mullions without mouldings, and for the door canopy, a very charming feature of the garden front, are the boldly-projecting masses of the building, and the rich effect of the light and shade consequent upon them. Leaded glass is used for the glazing throughout. The members were entertained to tea in a large garden alcove, by the kind courtesy of the owners, and at leaving the general opinion expressed was that the entire place showed the admirable result of a building, with its decorations, furniture, gardens, &c., all dominated by the individuality of one designer.

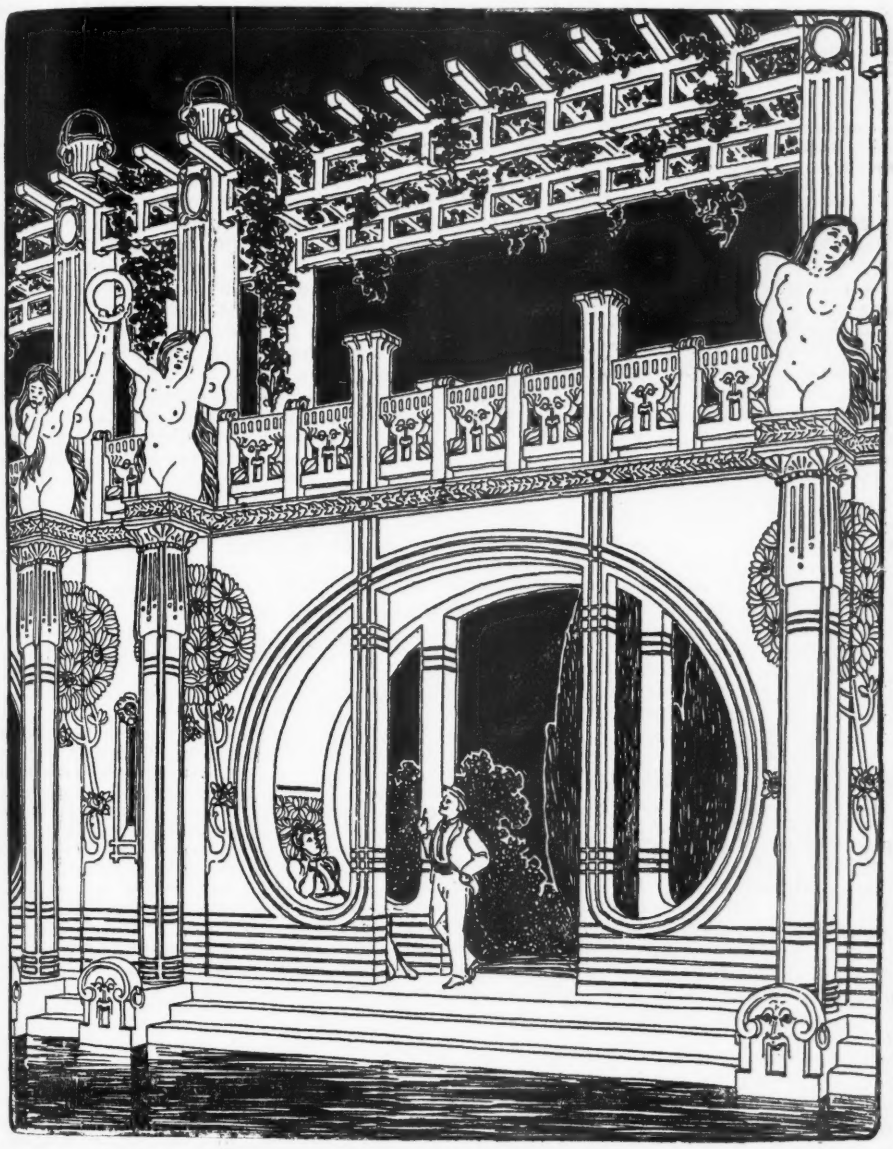
A little distance away was inspected Stoatly Hall, a very large residence by Messrs. Read & Macdonald, based as a design upon the smaller types of Sussex and Surrey manor-houses. The hall, with its gallery and lofty traceried windows and large bay, is a very fine apartment. There was much to interest the visitors throughout, particularly the elaborate arrangements of the bathrooms and sanitary fittings, also the very large arrangements for heating the building by hot water. The entrance lodge was particularly picturesque. The building commands very fine views from all its southern windows, but the idea impressed upon the visitor was that it was much too large for its site. The dressings have been carried out in Monks Park Bath stone, and the walling in Bargate stone, from near Godalming. The internal woodwork is entirely in walnut. Leaving here, Mr. Macdonald showed his own residence to the members, together with the drawing-room and hall, two very charming apartments, and afterwards some more specimens of his houses in the neighbourhood.

ARCHITECTURAL SOCIETIES.

DEVON AND EXETER ARCHITECTURAL SOCIETY.—The annual Report of this Society states that the membership has increased during the past year, but does not give the numbers. The Report mentions that the Council had conducted preliminary examinations in June and November (we presume this means in connexion with the Institute system of examination, though it is not so stated), and it congratulates one of their Associate members, Mr. Sydney Greenslade, on having obtained the Godwin Bursary of the Institute of Architects. Attached to the report are condensed reports of papers read during the session—by Mr. C. J. Tait, on "The Development of the Dwelling-house;" Mr. Ranson Pickard, on "Bacteria in Relation to Sanitation;" Mr. Arthur S. Parker, on "Building By-laws"; and Mr. F. W. Meyer, on "Garden Design."

ARCHÆOLOGICAL SOCIETIES.

NORTHUMBERLAND AND DURHAM ARCHÆOLOGICAL AND ARCHITECTURAL ASSOCIATION.—The Northumberland and Durham Archæological and Architectural Association visited on the 11th inst. the fine old Abbey Church, St. Mary's, Old Malton. Here Canon Greenwell acted as cicerone, and gave a description of the edifice. The church is really a fragment of a once glorious minster, and in ecclesiastical history it stands alone as the only church in this country founded by a purely English order—the Gilbertines—in which public worship continues to be offered. The Priory was founded by Eustace FitzJohn in 1150, and it was the most magnificent of all the Gilbertine houses. The Order was a hermaphrodite one, consisting of canons and ministers, but it has always been a much-disputed point amongst archæologists whether the Priory at Old Malton ever accommodated nuns or not. The church and monastic buildings went to partial decay after the Dissolution, and in 1636 the main central tower was taken down. The present remains are most interesting and beautiful, and, thanks to the generosity of Earl Fitzwilliam, the patron of the living and lay rector, are in excellent preservation. Canon Greenwell did not fail to point out the fine features of the great western doorway—said to be one of the most beautiful specimens of Norman work extant—the remarkable carvings and "inverted" inscriptions of the columns in the church, and the remains of old Norman work in the remaining aisle. A passing look at the adjacent Abbey residence, and the visitors then drove off to Appleton-le-Street, where the ancient church of All Saints was examined. Here are some rare old carvings and monumental figures, and also a fine late pre-Conquest tower. From Appleton to Barton, where the restored Norman church and ancient font (in the churchyard, by the way) were examined. Slingsby Castle ruins (the old home of the De Mowbrays), dating from the time of Charles I.; the village green and maypole (one of only five remaining in Yorkshire); and then on to Hovingham, where a halt for luncheon was called. Sir Wm. Worsley's fine old mansion, Hovingham Hall, with its re-



"A Seaside Promenade." By Herr A. Fritsche, Dresden.
(From the "Arhitektonische Rundschau.")

markable riding school, the church, the spa, and the park were in turn inspected, and then the party returned to Malton, dined together, and at 5.20 entrained for Newcastle again.—*Newcastle Chronicle.*

DESIGN FOR A SEASIDE PROMENADE.

THIS is reduced from a design published in the last issue of the *Architektonische Rundschau*. We give it as an example of one of the directions in which German taste seems to be developing. Comment is unnecessary.

COMPETITIONS.

REMODELLING OF A SHEFFIELD MARKET.—At the last meeting of the Sheffield Corporation the Markets Committee reported that they had advertised for and received competitive plans for the improvement of the Norfolk Market Hall. The award of Sir William Emerson, the Assessor in such competition, had been presented, and a report by the Markets Superintendent on the schemes indicated by the three sets of designs selected by the Assessor considered. The Committee recommended that the question of the improvement of the Norfolk Market Hall be deferred until such time as the proposed extension of the Sheaf Market has been completed and is ready for occupation, but that, in the meantime, increased lighting facilities be afforded in the market, and that the Markets Superintendent be instructed to obtain tenders from the Electric Supply Department and the Gas Co. for such increased lighting and the maintenance thereof; also that the roof be repaired where necessary, and that the Markets Superintendent be instructed to report as to the advisability of increasing the rents, and to what extent. The committee also recommended that the premiums of 100*l.*, 50*l.* and 25*l.* respectively be paid to the three successful competitors in this competition, subject to each giving an undertaking to the effect that, if his scheme, or any unimportant modification thereof, be carried out within, say, five years from March 25 last, the premium so paid to him shall be taken as in part payment of the commission of 5 per cent., which would become due to him as architect for the improvement. The first premium has been awarded to Messrs. Holmes & Watson; the second to Mr. H. I. Potter; and the third to Mr. Joseph Smith. The competition was confined to Sheffield architects.

BUILDERS' BENEVOLENT INSTITUTION.

THE annual general meeting of the subscribers and donors of this charity was held at the offices, 31 and 32, Bedford-street, Strand, W.C., on Wednesday, the 16th inst., the President, Mr. J. Carmichael, occupying the chair. The minutes of the last annual general meeting having been read and confirmed, the fifty-fifth Annual Report was read. The Report stated that, notwithstanding the many calls that have been made during the year upon the generosity of the charitably inclined, the Committee are gratified to be able to report a continuance of the steady financial support which they have been fortunate enough to receive in the past. They hope, however, to be able to celebrate the Coronation by extending their benefactions, and as to do so will require a larger income, the Committee appeal with confidence to their present supporters to increase their subscriptions and to enlist the practical sympathy of their friends. During the past year six men and five women were added to the pensioners' list. Every claimant's application was most carefully investigated by individual members of the Committee, the result being that all the eligible candidates were made annuitants, thus saving them the expense and trouble incidental to a contested election. There are now twenty-one men and twenty-seven women in receipt of pensions of 39*l.* and 27*l.* per annum respectively. Since the last Report five men and two women were removed by death. "Major Brutton, after acting as Secretary for twenty-seven years, was obliged to resign his appointment in consequence of bad health. He took with him into his retirement the respect and best wishes of all connected with the Institution. The Committee appointed Mr. T. Costigan to be his successor, and by changes made in the office and management, they have been able to reduce the expenses of administration. The offices are now under the same roof as other institutions connected with the building trade. . . . . The annual dinner will be held in the Carpenters' Hall . . . ."

On the motion of the Chairman, seconded by Mr. C. W. Patten, the Report was adopted.

Mr. J. T. Bolding, one of the auditors, then explained the income and expenditure account for the year, and showed that the Institution is in a satisfactory financial condition. On his motion, seconded by Mr. C. Bussell, the financial statement was agreed to.

On the motion of the Chairman, seconded by Mr. Bussell, it was agreed that Mr. W. Higgs (Messrs. Higgs & Hill, Ltd.) be President of the Institution for the ensuing year.

The new President then took the chair, and briefly thanked the meeting for electing him. He then proposed a hearty vote of thanks to Mr. Carmichael for the excellent manner in which that gentleman had acted as President.

Mr. A. Ritchie, J.P., seconded the vote of thanks, remarking that he hoped the time would come when they would be able to call on Mr. Carmichael to serve them for a second time as President.

The vote of thanks having been carried, Mr. Carmichael replied, and referred to the many acts of kindness he had received from the Committee and others during his year of office.

On the motion of Mr. Bussell, seconded by Mr. Ritchie, it was resolved: "That the thanks of the meeting be given to the Hon. Treasurer, Mr. J. Howard Colls, and to the Trustees, Sir Arthur C. Lucas, Bart., Mr. F. J. Dove, Mr. T. F. Rider, Mr. J. Howard Colls, Mr. T. Stirling, and Mr. J. T. Bolding."

The following gentlemen were then elected to form the Committee, with power to add to the number: Messrs. S. J. Thacker, T. F. Rider, G. N. Watts, J.P., E. S. Rider, T. Stirling, jun., J. Mowlem Burt, J.P., E. V. New, J. Carmichael, and E. Casselton.

On the motion of Mr. Stirling, seconded by Mr. Ritchie, it was resolved "That the thanks of the meeting be given to the Hon. Auditors, Mr. R. J. Ward and Mr. J. T. Bolding." These gentlemen were then re-elected Auditors for the ensuing year.

Votes of thanks were then passed to the Executive Committee, and the Vice-President.

The meeting then terminated.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Sir J. M'Dougall, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend the Lewisham Borough Council 2,835*l.* for erection of a caretaker's cottage and convenience at Home Park, Sydenham, and for paving works, &c.; the Camberwell Borough Council, 580*l.* for the purchase of a building for the enlargement of the Council's depot at Grove Vale; the Fulham Borough Council, 25,000*l.* for electric light installation; the Camberwell Borough Council, 750*l.* for erection of conveniences; the Metropolitan Asylums Board, 350,080*l.* for various building operations; and the Fulham Guardians, 11,110*l.* for works at the workhouse and infirmary.

Tramways.—The Finance Committee, reporting with regard to the proposed purchase of the South London Tramway Company's undertaking for 205,000*l.*, pointed out that the profits of the company in the year ended June 30, 1901, amounted to 11,400*l.* That would be about sufficient to meet interest and sinking fund on the cost of acquisition, but would leave little or no margin for the increase in the bill

of wages, and it was therefore probable that the immediate result of the purchase would be a deficiency. It must, however, be borne in mind that full advantage could not be obtained from these tramways until they had been converted to electric traction.

The Highways Committee recommended that the estimate of 205,000*l.* be approved, and that they be authorised to settle the precise terms of the agreement with the vendor company.

The Council adopted the recommendation.

The Highways Committee also recommended, and it was agreed, that the estimate for 59,000*l.* on capital account, submitted by the Finance Committee, be approved; and that the Highways Committee be authorised to issue an advertisement inviting tenders for the electrical cars required for the Streatham portion of the London County Council tramways.

The same Committee recommended that application be made in the next Session of Parliament for powers to enable the Council to enter into arrangements with any company reconstructing a bridge, for paying the extra cost involved in strengthening such bridges, so as to permit of the placing of electrical conduits in the carriage-way, or of the laying of a double line of tramway.

The recommendation was agreed to.

It was also agreed, after discussion and the rejection of an amendment to the effect that tenders be invited for the work :—

(*a*) That the expenditure on capital account of a sum not exceeding £30,000 be approved, in respect of the first portion of the building and other works in connexion with the car-shed accommodation to be provided on the site of the Clapham depot of the London County Council Tramways and land adjoining.

(*b*) That the Works Committee be authorised to carry out the work specified in the above resolution.

Improvement, Woolwich.—The Improvements Committee recommended, and it was agreed, that the estimate of 7,600*l.* submitted by the Finance Committee be approved, that the Improvements Committee be authorised to secure the widening of Mill-lane, Woolwich, to not less than 40 ft.

Proposed Railway Station at Essex-road.—On the recommendation of the Building Act Committee it was agreed :—

"That the Council, in the exercise of its powers under Sections 45 and 53 of the Great Northern and City Railway Act, 1892, but in no way otherwise than under such sections, do consent to the erection of a station building on the north-west side of Essex-road, Islington, to abut also upon Canonbury-road, in accordance with the plan dated July 1, 1902, submitted with the application of Messrs. Douglas, Young & Co. for the G.R. and City Railway Co. . . ."

The Building Line.—Mr. Shepheard drew attention to a letter by Dr. Little which had appeared in the public Press stating that there was one building line for the rich and one for the poor.

Dr. Little rose to further emphasise his point, and said that he was prepared to take the responsibility of and to prove every statement in that letter. He alleged that the Council was acting in this matter without full knowledge, and that they were doing an injustice to the public.

Tenders.—The following recommendations of the Highways Committee were agreed to :—

(*a*) That the tender of the Sir Hiram Maxim Electrical and Engineering Co., Ltd., for the supply, delivery, and erection, for the sum of 2,268*l.* 7s., of the steam, exhaust, feed and other piping, valves, &c., required in connexion with the temporary electricity generating-station to be established by the Council at Loughborough Junction, be accepted.

(*b*) That the Sir Hiram Maxim Electrical and Engineering Co., Ltd., be allowed to sublet parts of the work, included in the contract, as follows :—To Messrs. A. J. Stewart & Menzies, the steam-pipes; to Messrs. Clay, Henriques & Co., Ltd., the exhaust-pipes; to Messrs. J. Hopkinson & Co., Ltd., the steam and feed valves; to Messrs. Hamilton, Woods & Co., Ltd., the exhaust-valves; to Messrs. Suffield & Brown, the expansion-joint; to Messrs Newton & Nicholson, the joint-rings; and to Messrs. Jones & Horsfield, the non-conducting material.

The following recommendations of the Main Drainage Committee were also agreed to :—

"That the tender of Messrs. Clay, Henriques & Co., Ltd., amounting to 649*l.* 10s., for the supply and erection of two cast-iron feed-water tanks, with all accessories complete, at the Crossness outfall, be accepted.

That the offer of Messrs. Clay, Henriques & Co., Ltd., to supply the sludge-loading pipes, &c., required at the Crossness outfall for the sum of 157*l.* be accepted, and that the work of laying the pipes be executed by men directly employed by the Superintendent.

That the offer of Messrs. W. C. Rendle & Co. to provide and fix a new glazed roof on the auxiliary engine-house at the Crossness outfall for the sum of 180*l.* 9s. 2d. be accepted."

Appointment of Assistant Engineer.—On the recommendation of the Main Drainage Committee, it was agreed to appoint Mr. R. M. Gloyne, Borough Engineer of Eastbourne, as assistant engineer for main drainage works on the south side of the River Thames.

The Barbican Fire.—The Fire Brigade Committee submitted a long report on the serious fire which occurred on the night of April 21 last in the Barbican. They shared the Chief Officer's opinion that the existence in the City of so many *culs-de-sac*, of which New Zealand-avenue was by no means the worst example, constituted a grave source of danger. As was shown by the Barbican fire, such a building arrangement prevented the brigade stopping a huge conflagration, and, moreover, the rescue of people from premises in a *cul-de-sac* might prove an exceedingly difficult undertaking. The Committee proposed to communicate with the City Corporation and the Building Act Committee on the subject. The Report also referred to the recommendations of the jury, which had not been carried out, with regard to water supply and fire-alarms.

The Report was received.

The Housing Question.—The Housing of the Working Classes Committee submitted the accounts of the working-class dwellings for the year ending March 31. The dwellings mentioned in the accounts included 2,591 tenements, 358 cottages, and 324 cubicles, providing accommodation for 15,052 persons. During the year new dwellings had been opened giving accommodation to 2,856 persons, while since the accounts had been made up further dwellings, giving accommodation for 1,214 persons, had been opened. The total gross income for the year amounted to 58,058*l.* 15s. 6d., and of this 53,315*l.* 14s. 4d., or 91·83 per cent., was required for outgoings during the year, as against 94·76 per cent. required during the year 1900-1. There is thus a surplus balance on the year's working of 4,743*l.* 1s. 2d. The accounts show that, taking one year with another up to date, there is, as a whole, no deficiency on income account as a result of the Council deciding itself to erect and manage dwellings. The total expenditure on capital account on all the dwellings up to March 31 amounted to 931,459*l.* 3s. 1d.

Mr. Cousins remarked that the Report would be very satisfactory if they could feel that their tenants were the persons who had been dishoused. It was stated that there was no charge upon the rates, but it must be remembered that they were in the habit of writing down the commercial value of the land for housing. Up to the present the actual cost of the land for housing purposes was 789,000*l.*, but the value charged against the housing schemes was only 162,000*l.*

Lord Welby, as Chairman of the Finance Committee, congratulated the Chairman of the Housing Committee on the result of the Committee's work.

Mr. Beachcroft said the accounts were apparently satisfactory, but the fact that the land had been written down should be stated to the public.

Sir Wm. Collins (Chairman of the Committee) agreed that the fact of the writing down in value of sites should be known to the public, but under the Act under which they had to carry out their work, no other course was open to them. In every case they accepted the site at the housing value fixed by the valuer.

The report was adopted, and the Council was counted out at twenty minutes past seven.

MEANS OF ESCAPE IN CASE OF FIRE.

AT the meeting of the London County Council on Tuesday the Building Act Committee submitted the following Report, the consideration of which was adjourned for a week :—

"By the provisions of the Factory and Workshop Acts, 1891 and 1895, the duty was imposed upon the Council of seeing that each factory or workshop situated within the Administrative County of London, in which more than forty persons were employed, was provided on the stories above the ground floor with such means of escape in case of fire for the persons employed therein as could reasonably be required in the circumstances of each case. With a view to assisting owners (1) of new buildings in making applications for the Council's certificate that their premises were provided with proper means of escape in case of fire; (2) of old buildings in submitting proposals to comply with the requirements of the Council, it was found desirable to draw up a statement as to the means of escape that would in general be required. Such a statement was adopted by the Council on June 13, 1899, but, in consequence of the passing of the Factory and Workshop Act, 1901, it is necessary to make certain alterations in it, the principal one being that means of escape are now required to be provided from all floors instead of from all floors above the ground floor. The other alterations are in the main rendered necessary by the substitution of the Act of 1901 for the earlier Acts. We recommend—That the Council do approve the following statement with reference to its requirements in respect of the means of escape in case of fire from factories, workshops, &c., in accordance with the provision of the Factory and Workshop Act, 1901 :—

By the provisions of Sections 14, 103 (1) (*d*), and 153 (1) of the Factory and Workshop Act, 1901, the duty is imposed upon the London County Council of seeing that each factory, workshop, or laundry situated within the Administrative County of London in which more than forty persons are employed, is provided with such means of escape in case of fire for the persons employed therein, as can reasonably be required in the circumstances of each case.

The Council, on the , approved the following statement with reference to the requirements in respect of the means of escape in case of fire to be provided in accordance with the provisions of the above Act, with a view to assisting factory owners and others in making application for the Council's certificate, or in submitting proposals to comply with the Council's requirements in respect thereof. This statement must not, however, be taken as binding upon the Council, but only as a general guide or indication, since each case is, after full consideration of the varying circumstances, dealt with upon its merits; and nothing herein contained must be taken as in any way interfering with or derogating from the powers of the Home Office, the Council, the District Surveyors, or of any other Authority whatsoever under the Factory Act, the London Building Acts, or any other Act, or under any by-laws that may be made under Section 15, Section 153, Sub-Section 3, of the Factory and Workshop Act, 1901, or under any by-laws or regulations relating to the construction of buildings or otherwise, or as constituting any consent, sanction, allowance, or permission under any such Act, by-law, or regulation, but all such Acts, by-laws, and regulations must be fully observed and complied with, notwithstanding anything herein contained.

Applications.—1. Applications for the Council's certificate in respect of the means of escape from new buildings, and applications with proposals to meet the Council's requirements in respect of the means of escape from old buildings should state—

(*a*) The number of persons employed or to be employed on the premises, specifying the number of males and females employed or to be employed on each floor.

(*b*) The trade carried on or to be carried on on each floor, with particulars of machinery, power, &c.

(*c*) In the case of existing buildings used as factories, whether the premises were erected before January, 1892, and in the case of workshops and laundries, whether erected before January, 1896.

(*d*) The name and address of the owner.

(*e*) Particulars of the occupation of the building if existing, and if any part is used otherwise than as a factory or workshop or laundry, particulars of the tenancy of such part should be furnished.

2. Applications should be accompanied by complete plans and sections drawn on the unglazed side of tracing linen to ⅛-in. or ¼-in. scale (⅛-in. scale preferred), and by a block plan to a small scale showing the premises and the surrounding buildings and thoroughfares, such block plan to have the north point indicated.

Means of Escape.—3. The number of staircases required depends, *inter alia*, upon the following circumstances :—

(*a*) The area of the building.

(*b*) The number of persons employed, or which could be employed.

(*c*) The disposal of the workpeople.

(*d*) The alternative means of escape which may be available.

4. It may, however, be laid down as a general principle (subject to the exceptions hereinafter mentioned) that distinct and separate alternative means of escape, exclusive of windows, loophole doors, &c., are required from each floor, by one of the follow means :—

(*a*) A second staircase in the same block;

(*b*) A proper staircase in another block, to which access is available on all the floors by proper openings in the party or division walls, or by external communication ;

(*c*) Open iron bridges where the blocks are not adjoining each other.

5. The means of escape from each of the floor levels should be placed as far apart as possible.

6. In all cases where practicable, some means of escape from the roof of the building to the roof of adjoining premises should be provided.

7. In small and inextensive premises where not more than thirty persons are employed above the ground floor, and in some cases where it is possible to provide a staircase in a central position, one properly enclosed staircase, constructed of incombustible materials, may be accepted ; but in all cases where only one staircase is provided, some means of escape from the roof to the roof of adjoining premises, *must* be provided.

8. *Internal Staircases.*—Staircases should be placed next to an outer wall, and must be so arranged as to deliver by means of a doorway, not less than 4 ft. 6 in. wide in the clear when the doors are open, direct into the outer air at the ground level into a public way or thoroughfare or some large open space. Staircases must also be so arranged that persons enter them from any floor level in the same direction as persons descending the staircases.

9. Staircases must be properly lighted and ventilated by windows.

10. Staircases, including landings and passages from one flight to another, must be inclosed with newel and inclosing walls, not less than 9 in. thick, carried up above the roof and ceiled with iron and concrete.

11. Staircases must be constructed of incombustible materials, with solid square or spandril steps, arranged in straight flights, without winders ; each flight must consist of not more than fifteen steps, which must be supported at both ends on brickwork, and landings must be provided at the top and bottom of each flight and between the flights. The steps and landings must be of the same width as the staircase (see No. 14) and not less than 6 in. thick. In the case of spandril steps, however, the thickness at the smallest part may be as set out in No. 16.

12. The treads of the staircases must be not less than 10 in. wide clear of nosings, and the risers not more than 7½ in. high.

13. Staircases must be provided with handrails fixed upon both sides thereof and continued round the landings and chased into the ends of the newel walls.

14. The width of staircases is to be regulated as follows :—

a. Where the premises are adapted for the employment of less than 200 persons on the floors above the ground floor, the staircases must be not less than 3 ft. 6 in. wide.

(*b*) Where the premises are adapted for more than 200 persons on the floors above the ground floor, or where more than 100 persons are employed on any one floor above the ground floor, the staircases must be not less than 4 ft. 6 in. wide.

15. Staircases must in all cases be connected with all floors and the roof by means of doorways of the same width in the clear when the doors are open, as the staircases.

16. Spandril steps, where used, must be of the following thickness—

(*a*) For 3 ft. 6 in. staircases, not less than 3 in. thick in the smallest part.

(*b*) For 4 ft. 6 in. staircases, not less that 4½ in. thick in the smallest part.

17. All doorways to staircases must be fitted with doors of fire-resisting materials (solid teak or oak 2 in. thick or other approved material) in two folds, hung so as to open in the direction of exit or to swing both ways clear of steps, landings, passageways and footways ; such doors must be fitted with springs, weights, or other approved appliances to close them after use, and, if required to be fastened during the time the workpeople are upon the premises, be fitted during such time with automatic bolts only, so that the doors open by pressure from the inside.

18. In the case of old buildings* (in respect of which the Council is not required to issue a certificate) where there is a distinct and separate alternative means of escape provided to the satisfaction of the Council, from each of the upper floors, the inclosed staircase may be constructed of teak or oak, not less than 2 in. thick, including the treads, strings, carriages, bearers, landings, joists, and floors, the risers to be not less than 1 in. thick, but no fir or pine must be used ; and the inclosure to the staircase may be a solid partition of incombustible material at least 3 in. thick ; but such staircase must, in all other respects, be formed and arranged as required for a staircase for a new building as regards width, going, treads, risers, doors, handrails, &c. (see Nos. 8-17).

External Staircases.—19. In cases in which external iron staircases are accepted by the Council as means of escape, they must be constructed with dead bearings and without cantilever work.

20. They must comply with the requirements Nos. 8–17 as regards width, going, width of treads, height of risers, doors, handrails, &c.

21. They must deliver into the outer air at the ground level into a public way or thoroughfare, or some large open space.

22. Where an iron staircase is in general use the treads must be of approved non-slippery material as distinguished from perforated iron or chequered iron plates.

23. All windows and similar openings by, or near, any such staircases must be protected with kiln wire, or glazed with a combination of glass and wire or other approved fire-resisting glazing.

General.—24. Proper guard rails must be provided to the routes of escape on roofs, &c., where necessary, to the satisfaction of the Council.

25. Clear gangways, at least 3 ft. 6 in. wide, must be kept up to, and between, all staircases, bridges, and exits on all floors.

26. All doorways, and all passageways, must, where of a less width than 3 ft. 6 in., be increased to that width.

27. All doors usable as means of exit must be made so as to open in the direction of exit, or to swing both ways clear of steps, landings, passageways, &c.

28. All such doors must, if required to be fastened during the time the workpeople are upon the premises, be fitted during such time with automatic bolts only.

29. Lifts should be inclosed all up with brickwork 9 in. thick, or with incombustible material of approved quality and thickness, and fitted with iron or other fire-resisting doors, unless, with the approval of the Council, such lifts be inclosed with fire-resisting materials to a height of 4 ft. above each floor level, and above this with stout wire-mesh guard.

30. Lifts must be kept at some distance from staircases, and must in no case be connected directly therewith by means of openings or otherwise.

31. All windows on the floors above the ground floor, facing the public-way, street, thoroughfare, or open space, must be made to open easily at sill level to a sufficient height and width to allow a full-grown person to pass through in case of need.

* By the term "old buildings" is meant those of which the construction was begun before—
In the case of factories, January 1, 1892.
In the case of workshops and laundries, January 1, 1896.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses :—

Norwood.—The erection of houses on the northern side of St. Louis-road, Auckland-hill, West Norwood, between St. Bernard's-road and St. Gothard's-road (Mr. R. Pipette).—Consent.

Lines of Frontage and Projections.

Woolwich. — Projecting lamp at the Director General public-house, Wellington-street, Woolwich (Mr. B. W. Adkin for Messrs. T. Norfolk & Sons).—Consent.

Lewisham.—Four houses on the east side of Bromley-road, Catford, opposite Berlin-road (Messrs. Norfolk & Prior for Messrs. Kennard Brothers).—Consent.

Marylebone, East.—A projecting iron sign in front of No. 28, Berners-street, St. Marylebone (Messrs. Teale & Somers).—Consent.

Dulwich.—Two-story houses in proposed new streets, to be named Copleston-road (in continuation), Oglander-road (in continuation), Bellenden-road (in continuation), Placquett-terrace (in continuation), and Oxenford-street (Mr. W. Oxtoby for the Council of the Metropolitan Borough of Camberwell).—Consent.

Finsbury, Central.—Two one-story shops on part of the forecourts of Nos. 140 and 142, Pentonville-road, Finsbury (Mr. H. H. Tasker for Mr. J. King).—Consent.

Finsbury, Central.—A one-story bay-window at the first floor level and an oriel window at the first and second floor levels in front of the Angel Hotel, at the corner of Islington High-street and Pentonville-road, Clerkenwell (Messrs. F. J. Eedle & Meyers for Messrs. Truman, Hanbury, Buxton, & Co., Ltd.)—Consent.

Finsbury, East.—An iron and glass shelter in front of the porch at the entrance to Cocker's Hotel, Nos. 18 to 21, Charterhouse-square, Finsbury (Mr. E. Haslehurst for Messrs. Wheeler & Warren).—Consent.

Hackney, North.—A mission-hall on the west side of Wordsworth-road, Stoke Newington (Messrs. J. E. K. & J. P. Cutts for the Rev. W. A. Buck).—Consent.

Hammersmith.—Buildings with shops on the ground floor, on land between Nos. 142 and 146, Uxbridge-road, Hammersmith (Mr. P. G. May for E. J. Clayton).—Consent.

Lewisham.—Barge boards and wood-framed pents to Nos. 2, 4, 6, 8, and 10, Stillness-road, Lewisham (Mr. G. M. Webb).—Consent.

Lewisham.—An iron and glass shelter in front of St. Cyprian's Hall, Brockley-road, Lewisham (Mr J. J. Downes for the Rev. W. V. Mason).—Consent.

St. George, Hanover-square.—A stone balcony, with iron railing, at the first floor level in front of No. 11, Clarges-street, Piccadilly (Mr. M. E. Collins for Mr. A. Frankau).—Consent.

Wandsworth.—Extension of the period within which the erection of houses with one-story shops on the site of The Hawthorns and grounds on the west side of Balham High-road, Wandsworth, at the corner of Marius-road, was required to be completed, be granted (Mr. F. Perks for Mr. R. Simpson).—Consent.

Wandsworth.—Six-story bay windows to two blocks of residential flats known as Kenilworth-court, Lower Richmond-road, Putney (Mr. R. C. Overton for Messrs. R. Emerson and J. Coleman).—Consent.

Wandsworth.—A four-story building on the site of No. 308, Brixton Hill, Brixton, at the corner of Streatham-place (Messrs. Dale & Gadsdon for Messrs. Herring, Son, & Daw).—Consent.

Islington, West.—Retention of a wooden signboard on the south-west side of Holloway-road, Islington, at the corner of Parkhurst-road (Mr. F. Matcham for Mr. F. W. Purcell).—Consent.

Chelsea.—Three projecting windows in front of the Swan tavern, Sloane-street, Chelsea (Mr. L. A. Withall for Messrs. Roberts & Gilling).—Refused.

Clapham.†—One-story shops on part of the forecourts of Nos. 55 to 69 (odd numbers only inclusive), Northcote-road, Battersea (Mr. A. Boon for the Executors of the late J. Boon).—Refused.

Dulwich.—The erection of steel, wood, and glass roofs over the forecourts of Nos. 1 and 3, North Cross-road, East Dulwich (Mr. H. G. Tarrant for Mr. F. C. Warman).—Refused.

Hampstead.—Buildings on the south side of Lymington-road, Hampstead, near Finchley-road (Mr. O. E. Winter for the Council of the Metropolitan Borough of Hampstead).—Refused.

Lewisham.—The retention of a pigeon-house in the garden at the rear of No. 53, Vancouver-road, Forest Hill, abutting on Elsinore-road (Mr. T. J. Ambrose).—Refused.

Lewisham.—One-story shops in front of proposed houses on the east side of Ardgowan-road, Lewisham, southward of Dowanhill-road (Mr. A. C. Baker for Mr. F. Horwood).—Refused.

Marylebone, East.—Enclosure to the entrance portico of No. 21, Portland-place, St. Marylebone (Messrs. Ray & Murrell for Sir Archibald Edmonstone, Bart.).—Refused.

Norwood.—One-story shops on the forecourts of Nos. 16 and 18, Tulse Hill (Messrs. Peacock Brothers for Messrs. H. G. Englefield and W. Sayer).—Refused.

Woolwich.—A vicarage room on the south side of Upper Ripon-road, Plumstead (Mr. V. E. Young for the Rev. S. Warner).—Refused.

Hammersmith.—A one-story addition in front of No. 26, Glenthorne-road, Hammersmith (Mr. T. W. Biggs for Mr. R. Dean).—Refused.

Width of Way.

Limehouse.—Buildings to be used as casual wards, with the forecourt boundaries and the external walls of two water-closets at less than the prescribed distance from the centres of the roadways of Maroon-street and Eastfield-street, Limehouse (Mr. F. Baggallay for the Guardians of the Stepney Union).—Consent.

Poplar.—A one-story addition to the mission church on the west side of Hale-street, East India Dock-road, Poplar (Sir A. Blomfield & Sons for the Rev. E. E. Sinker).—Consent.

Whitechapel.—A warehouse building on the south side of Corbet's-court, Little Pearl-street, Whitechapel (Messrs. Hammack, Lambert, & Son for Messrs. Godfrey Phillips & Sons).—Consent.

Bethnal Green, South-west.—That the request of Mr. G. H. Lovegrove, in reply to a penal notice served on Mr. R. Button, for permission to complete a building commenced to be erected on the south side of Princes-court, Bethnal Green, and offering in connexion with the development of the west side of Gibraltar-walk to widen that street on certain conditions, be not acceded to.—Agreed.

Bermondsey.—A building on the east side of Bermondsey-street, Bermondsey, to abut also upon Crucifix-lane (Mr. E. J. W. Hider for Mr. W. H. Hazard).—Refused.

Hackney, South.—Two dwelling-houses on the west side of St. Thomas's-place, Well-street, Hackney (Mr. A. Martin for Mr. F. Byford).—Refused.

Limehouse.—The retention of a forecourt fence in front of Haileybury House, at less than the prescribed distance from the centre of the roadway of Durham-row, Limehouse (Mr. O. F. Stenning for the trustees of the Haileybury Guild).—Refused.

Westminster. — Office buildings on the site of Nos. 10, 11, and 12, Great College-street, Westminster, at the corner of Little College-street (Mr. H. Shelmerdine for the Lancashire and Yorkshire Railway Company).—Refused.

Space at Rear.

Southwark, West.—A modification of the provisions of Section 41 of the Act with regard to open spaces about buildings, so far as relates to the proposed erection of an addition at the rear of the Grammar School House, Sumner-street, Southwark

(Mr. A. H. Ryan-Tenison for the Rev. A. W. Corbett).—Consent.

St. George, Hanover-square.—Deviations from the plans certified by the District Surveyor, so far as relates to the erection of an addition to No. 13, Upper Brook-street, St. George, Hanover-square, and also the erection of a porch at the premises Mr. P. A. Todd for Mr. W. Tebb).—Refused.

Lines of Frontage and Width of Way.

Hammersmith.—The retention of a wooden shed at the rear of No. 103, Askew-road, Hammersmith, with the external walls at less than the prescribed distance from the centre of the roadway of Landor-road, and in advance of the general line of buildings in that street (Mr. W. Smith).—Consent.

Formation of Streets.

Dulwich.—That an order be issued to Mr. W. Oxtoby sanctioning the formation or laying out of new streets for carriage traffic in continuation of Copleston-road, Bellenden-road, Oglander-road, and Placquett-terrace, and to connect the proposed continuations of Copleston-road and Oglander-road (for the Council of the Metropolitan Borough of Camberwell). That the names Copleston-road (in continuation), Oglander-road (in continuation), Bellenden-road (in continuation), Placquett-terrace (in continuation), and Oxenford-street, be approved for the new streets.—Agreed.

Islington, South.—That an order be issued to Mr. R. Nevill sanctioning the formation or laying out of a new street for carriage traffic to lead from Pleasant-place to Canonbury-villas, Canonbury, and in connexion therewith the widening of a portion of Canonbury-villas (Mr. H. A. Horton and Mrs. C. H. Tufnell).—Consent.

Greenwich.—That an order be issued to Mr. D. G. Horlock, refusing to sanction the formation or laying-out of a new street for carriage traffic to lead from Toddman's-lane to Woodlands-park-road, Greenwich.—Agreed.

Norwood.—That an order be issued to Messrs. J. T. Bressey & Son, refusing to sanction the formation or laying-out of streets for carriage traffic to lead out of Herne Hill-road and Poplar Walk, Herne Hill, and in connexion therewith the widening of Poplar Walk (for Mr. R. A. Sanders).—Agreed.

Cubical Extent.

Bethnal Green, South-west.—The erection on the south side of Bath-street, Bethnal Green, at the corner of Lisbon-street, of a building to exceed in extent 250,000, but not 450,000 cubic feet. and to be used only for the purposes of the trade of a brewer (Messrs. W. Bradford & Sons for Messrs. Mann, Crossman & Paulin, Ltd.)—Consent.

Height of Buildings.

Islington, South.—Five houses on the west side of a proposed extension of Pleasant-place, Canonbury, to exceed in height the width of such proposed street (Mr. R. Nevill).—Consent.

Means of Escape from the Top of High Buildings.

Kensington, South.—Means of escape in case of fire on the fifth and sixth floors of a building to be erected on the north side of High-street, Kensington, at the corner of Brown's-buildings (Mr. P. E. Pilditch for Messrs. J. Barker & Co., Ltd.).—Consent.

*** *The recommendations marked † are contrary to the views of the Local Authorities.*

Illustrations.

MONUMENT TO GOUNOD.

THE illustration represents the monument to Gounod which is shortly to be erected in the Parc Monceau, Paris.

The sculpture is the work of M. Antonin Mercié, the architectural accessories are designed by M. Formigé. The figures symbolise some of the composer's principal operatic works—the Marguerite of "Faust," the Juliette of "Romeo et Juliette," &c.

The monument was exhibited in this year's Salon, but not in a quite complete state. The illustration shows the complete work as it will be erected.

DESIGNS FOR BUSINESS PREMISES, BIRMINGHAM.

THESE two designs for warehouses in Birmingham, the one in Cannon-street the other in Cornwall-street, are both by Messrs. Bateman & Bateman, architects, of Birmingham, and were both exhibited at the Royal Academy of 1900. That for Cornwall-street was designed for printing works, that for Cannon-street as a warehouse for Manchester goods.

Unfortunately we hear from the architects that both of these schemes fell through after working drawings had been prepared; unfortunately, for they appear to us to be very good examples of the treatment of warehouse buildings in a characteristic and picturesque manner.

Both buildings were to be of steel and concrete construction, the concrete surface being finished with roughcast. The iron railed balconies were provided for the purpose of window-cleaning.

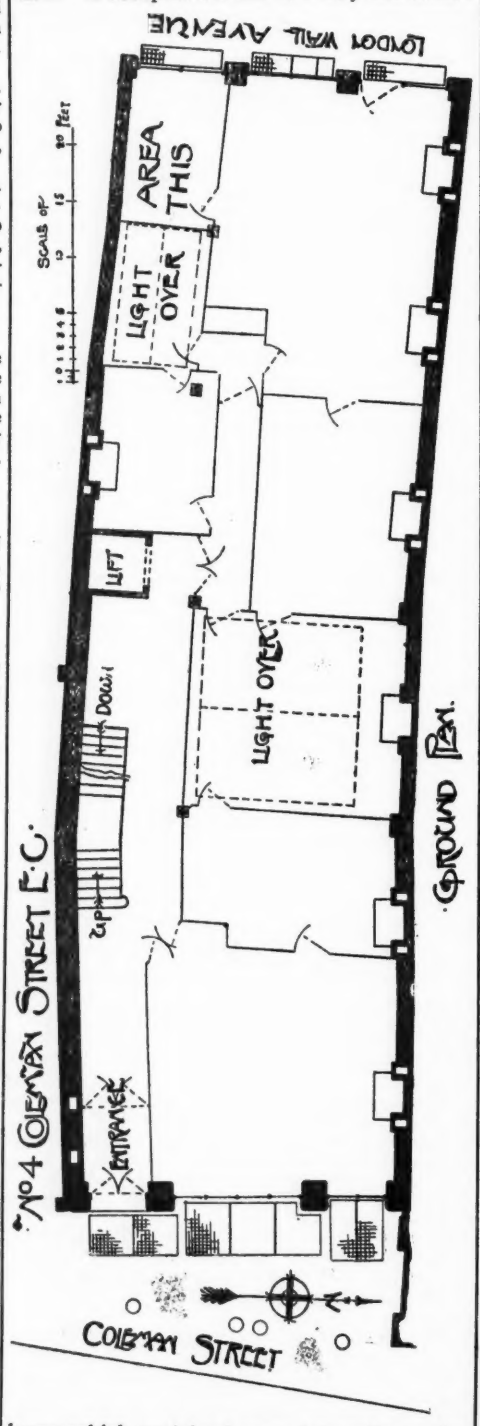
A STREET FRONT.

THIS is a design of some originality, for the treatment of a narrow street front, made by Mr. W. Moss Settle, of Ulverston (Lancashire). It is, we understand, merely a study of a street front, and not a building on any actual site.

The bold treatment of the ground story is the best point in the design. The author would have done better to have avoided the segmental arch line in the second stage of the design, as it clashes with the line of the circular arch of the ground story. A straight line would have worked better into the composition.

OFFICES, 4, COLEMAN-STREET, E.C.

THIS building has recently been erected by Messrs. Colls & Sons, of Coleman-street, E.C. It occupies the site of a City merchant's



house which contained some interesting cedar panelling and two chimney-pieces which have been preserved. The construction is fire-resisting throughout, and the front to Coleman-street shown in our illustration is of Portland stone.

Mr. Ernest Flint is the architect.

COTTAGES AT WOLVES NEWTON.

THESE cottages are in course of erection at Wolves Newton, near Chepstow, South Wales, for Mr. H. J. Simpson. The walls are built up with local stone, the porous quality of which has necessitated the extra thicknesses of the external walls.

These walls will be externally covered with white rough cast, and the roofs covered with dull red Bridgwater tiles. The external woodwork and porch to single cottage will be oak.

In the pair of cottages the copings to dormers, porch, and tops of chimneys will be in grey Forest stone.

The builders are Messrs. E. Turner & Sons, of Cardiff. The architect is Mr. A. J. Hardwick, of Kingston-on-Thames.

CLUB-ROOM, BEEFSTEAK CLUB.

THIS represents a room built from the designs of Mr. F. T. Verity for this historic club.

We are unable to give any structural or other details about it, in consequence of the absence of the architect from town.

BOOKS RECEIVED.

GARDEN CITIES OF TO-MORROW.—By Ebenezer Howard. (Swan Sonnenschein & Co. 1s.)

Correspondence.

CEMENT INLAY.

SIR,—Would you oblige by assisting me with the following:—

I recently used a composition—Parian cement, lampblack, and alum—as a cement inlay in statuary marble to take a polish. This composition has not been a success, as not only no polished surface is obtainable, but the alum or some other ingredient has come to the surface.

Could you inform me how this rough and whitened surface could be made black, and if you could suggest a suitable composition for future use?

JOSEPH WHITEHEAD.

*** We are afraid that there is no efficient remedy, as the cement employed is unsuitable for the purpose, and nothing short of picking it out and substituting a better one will do any permanent good. The following will, we believe, be found to answer for the stopping:—Yellow wax, resin, and Burgundy pitch mixed with lamp-black, and made into a thick paste with a little sulphur and finely-sifted plaster. The proportions of wax and resin should be about equal, and the pitch and lamp-black should be added until the whole mixture is quite black. Another stopping may be made of six parts of sulphate of iron to one of rough saltpetre. This is exposed for twenty-four hours, then reduced to a powder, washed several times, and rolled into sticks for use. A little of this mixed with some lamp-black has been found useful. Of course, such stoppings are unsuitable for outdoor work.

The Student's Column.

3.—ARTIFICIAL BUILDING STONE; THE PRESERVATION OF STONE.

ARTIFICIAL stone has been used for building purposes from time immemorial. The ancient Egyptians used it in the form of concrete blocks composed of pebbles, broken stone, and lime. Concrete blocks were also extensively used by the Romans. The modern production of building stones of a finer grade, closely resembling those of natural origin, may be regarded as a natural development of the industry which commenced with the manufacture of concrete masses of various shapes and sizes for use as a substitute for blocks of natural stone.

The introduction of greatly improved crushing and grinding machinery, the progress in scientific knowledge, and the production of chemicals and high-grade cement at comparatively low cost has already resulted in the manufacture of building stones which compare favourably in many respects with some of the best stones from the quarries. The cost of producing good artificial stone until recently prevented its extensive use in mass; but for paving, for steps, for copings, and for the stone facings of brick buildings, it has long been successfully employed.

A natural prejudice against artificial stone has in the past prevented it from being gene-

rally used for important work, for builders have rightly preferred to employ stone which has been in good repute for centuries in preference to an artificial product of unknown value. The rapidly increasing production of the best forms of artificial stone proves, however, that this prejudice is being overcome.

A description of all the artificial stones invented during the last century cannot be given in these columns. The endless list of patentees of artificial stone affords evidence that the possibility of preparing an artificial product to compete with natural stone has been very widely recognised by many successive generations. Only a very small proportion of the inventions can, however, claim to have been of practical utility.

Victoria Stone.—The artificial product known as "Victoria Stone" is one of the stones most extensively used at the present time. It has been in use for some thirty years, and its production has gradually increased to an annual rate of about 15,000 tons, of which some 6,000 tons are used for architectural work, and the remainder mostly for paving.

Victoria stone is a mixture of crushed granite and Portland cement, which, after being moulded into blocks and hardened, is steeped in a solution of sodium silicate. Sodium silicate for stone manufacture is usually made by dissolving flint or a siliceous rock, such as Farnham stone, in caustic soda solution. Farnham stone is a natural rock containing about 40 per cent. of soluble silica, 15 per cent. alumina, and 45 per cent. quartz sand.

The granite employed is obtained from Groby, in Leicestershire, and, after being crushed to the required size, is carefully washed. Portland cement of the best quality is then mixed in the dry state with the crushed granite, and water is subsequently added until the mixture has assumed a suitable plastic condition. The mixture is then placed in moulds and allowed to set. The blocks, when sufficiently hard, are removed from the moulds and immersed for a number of days in a silicate bath. Finally, the blocks are taken out of the bath and exposed to the air for some time before they are permitted to leave the factory. During the process of manufacture the mixture can, of course, be treated with oxide of iron or any other suitable colouring matter to give the finished stone any desired tint.

According to Mr. Henry Reid, the composition of the granite employed, and of the finished artificial stone, is as follows :—

	Groby Granite.	Victoria Stone.
Silica (soluble) ...	0·55 ...	50·35
„ (insoluble) ...	65.26 ...	
Alumina ...	13·06 ...	11·87
Lime... ...	4·55 ...	18·33
Magnesia	1·01 ...	2 03
Oxide of iron ...	9·81 ...	7·33
Carbonic acid ...	0·03 ...	1·80
Soda	2·34 ...	3·81
Potash	2·85 ...	1 78
Water, &c.	0·54 ...	2·70
	100·00 ...	100·00

The practical success of the stone is no doubt largely due to the care taken in its manufacture and in the testing of the raw materials, which result in practical uniformity of the finished stone in both chemical composition and physical properties.

Except in situations where the stone is subjected to severe concussion, as in yards where the unloading of vans is performed, the artificial stone is found to be as good a paving material as natural York stone, and is less costly.

Indurated Slabs are a cheaper form of artificial stone also made by the Victoria Stone Co. These slabs are, like Victoria Stone, made with crushed granite and Portland cement. They are, however, merely steeped in water instead of in a siliceous bath before being air-dried. The output of this stone is about the same as that of the more expensive Victoria Stone, viz., 15,000 tons per annum.

Ransome's Artificial Stone. — Ransome's siliceous stone was one of the first of the modern types of artificial stone to be extensively adopted for building purposes. It is said to have been used in St. Thomas's Hospital, the India Office, the London Docks, and other important buildings ; but, so far as we are aware, it is not now manufactured. The stone was produced by mixing sand with sodium silicate and a small proportion of powdered flint or chalk. The sodium silicate was at first made by boiling flints in caustic soda solution, but afterwards Farnham stone was used instead of flint. When the different substances had been thoroughly mixed in suitable proportions, the mixture was placed in moulds. The blocks thus formed were then treated with a cold solution of calcium chloride, and were subsequently immersed in a boiling solution of the same salt. Chemical reaction took place between the soluble silicate of soda and the soluble calcium chloride, and soluble sodium chloride and insoluble calcium silicate were formed. The calcium silicate formed in the interstices of the blocks rendered the blocks as hard and durable as natural stone of the best quality, and the soluble sodium chloride was subsequently removed by treatment with water.

"Non-slip" Stone.—The artificial product known as "non-slip" stone is made with cement and crushed York natural stone. The mixture is made plastic by the addition of water and is then placed in moulds and subjected to powerful hydraulic pressure. The slabs of stone thus manufactured are more uniform in size and are more durable than slabs of natural York stone. They are also less liable to assume a polished surface and to become slippery than stone made with granite. This stone is now used very extensively.

Stuart's Granolithic Stone. — This is a mixture of crushed granite and cement. It is frequently made *in situ*, that is to say, the mixture is prepared and laid in plastic condition on the spot where the stone is required, being used, in fact, like concrete. For paving, for tanks, and for dock work it has proved exceedingly successful.

Other Artificial Stones.—There are a number of other artificial stones in the market. They mostly consist, like those already mentioned, of a good hard natural stone crushed to a granular condition and cemented with Portland cement of the best quality. The hardening of the more expensive descriptions is usually completed by treating them with sodium silicate solution, but with the aid of pressure in the production of the stone very good building material can be manufactured without the use of the soluble silicate.

Moreau Imitation Marble.—The term "marble" should be applied only to limestones having a crystalline form resembling that of loaf sugar, *i.e.*, to limestones having a "saccharoid" structure. Moreau marble is merely ordinary amorphous limestone, such as Portland stone, so treated that its surface appears like that of polished marble. The stone is not converted from amorphous into crystalline limestone, and it is not therefore converted into marble. The Moreau process, as described in the patents granted in 1892, consists in the following treatment of stone :—

Masses of any white porous limestone are treated either in plain blocks, or after being carved to any desired form. First, varnish is applied to the surface of the stone in spots or streaks, the varnish consisting of "a mixture of turpentine, gum thus, and sesquioxide of iron or rouge de Prusse." Next, the stone is immersed in baths of sulphate of iron, sulphate of copper, and sulphate of zinc, the order of sequence and the time of immersion varying with the nature of the stone to be treated and the effect to be produced. The salts of iron and copper impart colour to the stone except where it is protected by the varnish. The stone is then placed in a bath of hot water, and subsequently in a bath of sulphate of zinc to harden it. Finally, the stone is dried and polished. In appearance and polish this substitute for marble compares favourably with the genuine material.

The hardening effect of the sulphate of zinc requires explanation. It is stated that a reaction occurs between the lime and zinc salts, carbonate of zinc and sulphate of lime being formed ; but this information does not explain the physical result, for zinc carbonate is not harder or more durable than calcium carbonate, nor sulphate of lime than carbonate of lime.

Artificial Marbles.—The so-called artificial marbles, such as "Scagliola" and "Marezzo," contain no marble, but are merely masses of white plaster treated with suitable colours. The plaster is polished by rubbing it with a hard fine-grained stone and with snake-stone, and finally with linen rag moistened with linseed oil. The plaster employed may be either plaster of Paris or Keene's cement. Keene's cement is made by mixing plaster of Paris with a solution of alum and heating the mixture to a suitable temperature. Keene's cement can be made to assume a very high polish, and is now most commonly used. Exposure to rain would, of course, soon cause disintegration of these plaster imitations of marble.

The Preservation of Stone.—In 1839 was issued the Report of the Commissioners charged with the selection of stone for building the new Houses of Parliament. In 1861 was issued the Report of a Committee appointed to report upon the cause of the decay of the new Houses. The Commissioners recommended that magnesian limestone, from Bolsover Moor and its neighbourhood, should be employed, and it was commonly thought when the Houses were being built that this stone was being used. When, therefore, the new Houses showed alarming signs of decay soon after their erection, scepticism was naturally aroused regarding the utility of science as set forth in the Commissioners' Report. The Committee of 1861 found, however, that although Bolsover stone had been specified in the contract for building the Houses, the stone actually used was, for the most part, an inferior stone from the Anston quarries, and that proper precautions had not been taken to ensure that only the best stone from the quarries should be used. It is now known that the greater portion of the stone is not so bad as was at one time feared, but the information collected by the Committee with reference to the best means of preserving stone renders the Report a document of great value, and those desiring to study the subject thoroughly will find a considerable number of proposed processes therein discussed.

It would serve no useful purpose to describe in these columns all the schemes, some ingenious and many foolish, which have been proposed for the preservation of stone, but the following brief summary of the prevailing ideas on the subject may be serviceable :—

1. It would probably be possible to treat individual blocks of an inferior stone with such success that they would resist atmospheric influences as well as any good natural stone, but no stone can be satisfactorily treated in a large building after the blocks have been fixed in position. The cost of the treatment would also materially increase the cost of the stone.

2. A solution of silicate of soda will harden most limestones owing to the formation of silicate of lime in the pores of the stone. The soda which is left in the stone after the silica of the sodium silicate has entered into combination with the lime appears as an efflorescence of sodium carbonate or sulphate on the surface of the stone, and is objectionable.

3. A solution of suitable gum resins in petroleum is to some extent serviceable when the stone can be first thoroughly cleaned and then treated until the stone has absorbed as much solution as possible.

4. Treatment with limewater is mere waste of time and money. The absurdity of limewashing was recently pointed out by Prof. Church in a discussion on a paper by Mr. Caröe before the Architectural Association (see the *Builder*, April 19, 1902).

5. Treatment with barium hydrate solution is preferable to treatment with lime water because sulphate of barium is insoluble in water, whereas sulphate of lime is soluble. It has been repeatedly proved that the action of the atmosphere is to convert carbonate of lime into sulphate of lime, and in the same way carbonate of barium, which is formed as soon as barium hydrate solution is exposed to the atmosphere, would be converted into sulphate of barium. It is only during recent years that barium hydrate has been produced at a sufficiently low price to render its use practicable, and it is still doubtful whether it is of much value as a preservative.

6. Processes involving the use of barium hydrate, followed by treatment with superphosphate of lime, are of little practical value.

LOCAL IMPROVEMENTS AT ASTON.—A site at Aston Cross for the proposed free library has been presented to the town by Messrs. Ansell, brewers. The building will cost an estimated sum of 2,000*l.*, with 150*l.* for its equipment. The Town Council propose, with the sanction of the Local Government Board, to borrow a capital sum of 52,436*l.* for the carrying out of their electrical lighting scheme, and have already, under a Tramways Order, begun the foundations of the generating station. An application has been made by the Council for a charter of incorporation.

(Mr. A. H Ryan-Tenison for the Rev. A. W. Corbett).—Consent.

St. George, Hanover-square.—Deviations from the plans certified by the District Surveyor, so far as relates to the erection of an addition to No. 13, Upper Brook-street, St. George, Hanover-square, and also the erection of a porch at the premises Mr. P. A. Todd for Mr. W. Tebb).—Refused.

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Dulwich.—That an order be issued to Mr. W. Oxtoby sanctioning the formation or laying out of new streets for carriage traffic in continuation of Copleston-road, Bellenden-road, Oglander-road, and Placquett-terrace, and to connect the proposed continuations of Copleston-road and Oglander-road (for the Council of the Metropolitan Borough of Camberwell). That the names Copleston-road (in continuation), Oglander-road (in continuation), Bellenden-road (in continuation), Placquett-terrace (in continuation), and Oxenford-street, be approved for the new streets.—Agreed.

Islington, South.—That an order be issued to Mr. R. Nevill sanctioning the formation or laying out of a new street for carriage traffic to lead from Pleasant-place to Canonbury-villas, Canonbury, and in connexion therewith the widening of a portion of Canonbury-villas (Mr. H. A. Horton and Mrs. C. H. Tufnell).—Consent.

Greenwich.—That an order be issued to Mr. D. G. Horlock, refusing to sanction the formation or laying-out of a new street for carriage traffic to lead from Toddman's-lane to Woodlands-park-road, Greenwich.—Agreed.

Norwood.—That an order be issued to Messrs. J. T. Bressey & Son, refusing to sanction the formation or laying-out of streets for carriage traffic to lead out of Herne Hill-road and Poplar Walk, Herne Hill, and in connexion therewith the widening of Poplar Walk (for Mr. R. A. Sanders).—Agreed.

Cubical Extent.

Bethnal Green, South-west.—The erection on the south side of Bath-street, Bethnal Green, at the corner of Lisbon-street, of a building to exceed in extent 250,000, but not 450,000 cubic feet, and to be used only for the purposes of the trade of a brewer (Messrs. W. Bradford & Sons for Messrs. Mann, Crossman & Paulin, Ltd.)—Consent.

Height of Buildings.

Islington, South.—Five houses on the west side of a proposed extension of Pleasant-place, Canonbury, to exceed in height the width of such proposed street (Mr. R. Nevill).—Consent.

Means of Escape from the Top of High Buildings.

Kensington, South.—Means of escape in case of fire on the fifth and sixth floors of a building to be erected on the north side of High-street, Kensington, at the corner of Brown's-buildings (Mr. P. E. Pilditch for Messrs. J. Barker & Co., Ltd.).—Consent.

**** The recommendations marked † are contrary to the views of the Local Authorities.*

Illustrations.

MONUMENT TO GOUNOD.

THE illustration represents the monument to Gounod which is shortly to be erected in the Parc Monceau, Paris.

The sculpture is the work of M. Antonin Mercié, the architectural accessories are designed by M. Formigé. The figures symbolise some of the composer's principal operatic works—the Marguerite of "Faust," the Juliette of "Romeo et Juliette," &c.

The monument was exhibited in this year's Salon, but not in a quite complete state. The illustration shows the complete work as it will be erected.

DESIGNS FOR BUSINESS PREMISES, BIRMINGHAM.

THESE two designs for warehouses in Birmingham, the one in Cannon-street the other in Cornwall-street, are both by Messrs. Bateman & Bateman, architects, of Birmingham, and were both exhibited at the Royal Academy of 1900. That for Cornwall-street was designed for printing works, that for Cannon-street as a warehouse for Manchester goods.

Unfortunately we hear from the architects that both of these schemes fell through after working drawings had been prepared; unfortunately, for they appear to us to be very good examples of the treatment of warehouse buildings in a characteristic and picturesque manner.

Both buildings were to be of steel and concrete construction, the concrete surface being finished with roughcast. The iron railed balconies were provided for the purpose of window-cleaning.

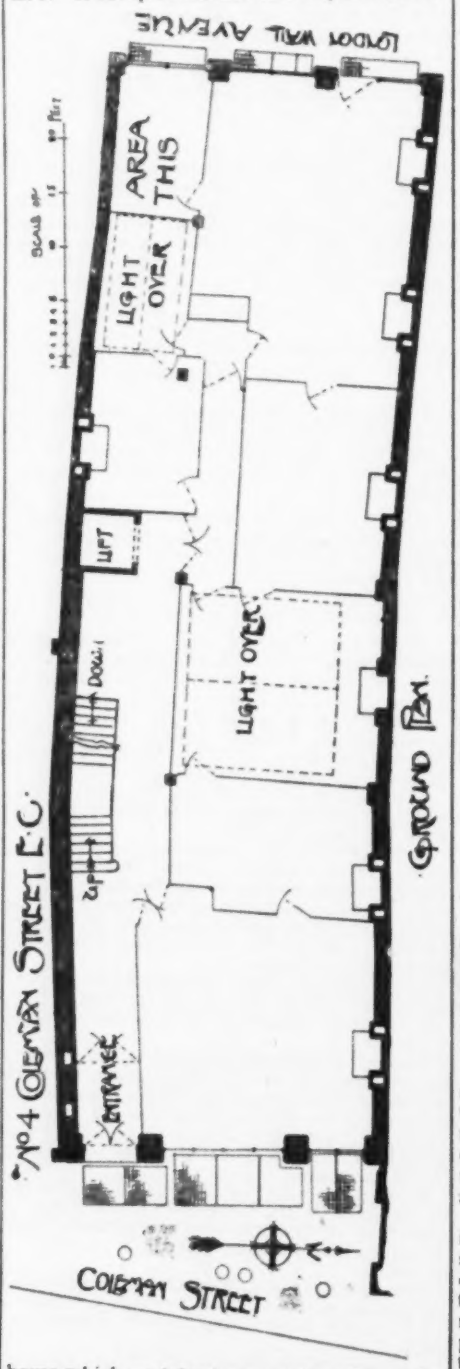
A STREET FRONT.

THIS is a design of some originality, for the treatment of a narrow street front, made by Mr. W. Moss Settle, of Ulverston (Lancashire). It is, we understand, merely a study of a street front, and not a building on any actual site.

The bold treatment of the ground story is the best point in the design. The author would have done better to have avoided the segmental arch line in the second stage of the design, as it clashes with the line of the circular arch of the ground story. A straight line would have worked better into the composition.

OFFICES, 4, COLEMAN-STREET, E.C.

THIS building has recently been erected by Messrs. Colls & Sons, of Coleman-street, E.C. It occupies the site of a City merchant's



house which contained some interesting cedar panelling and two chimney-pieces which have been preserved. The construction is fire-resisting throughout, and the front to Coleman-street shown in our illustration is of Portland stone.

Mr. Ernest Flint is the architect.

COTTAGES AT WOLVES NEWTON.

THESE cottages are in course of erection at Wolves Newton, near Chepstow, South Wales, for Mr. H. J. Simpson. The walls are built up with local stone, the porous quality of which has necessitated the extra thicknesses of the external walls.

These walls will be externally covered with white rough cast, and the roofs covered with dull red Bridgwater tiles. The external woodwork and porch to single cottage will be oak.

In the pair of cottages the copings to dormers, porch, and tops of chimneys will be in grey Forest stone.

The builders are Messrs. E. Turner & Sons, of Cardiff. The architect is Mr. A. J. Hardwick, of Kingston-on-Thames.

CLUB-ROOM, BEEFSTEAK CLUB.

THIS represents a room built from the designs of Mr. F. T. Verity for this historic club.

We are unable to give any structural or other details about it, in consequence of the absence of the architect from town.

BOOKS RECEIVED.

GARDEN CITIES OF TO-MORROW.—By Ebenezer Howard. (Swan Sonnenschein & Co. 1s.)

Correspondence.

CEMENT INLAY.

SIR,—Would you oblige by assisting me with the following:—

I recently used a composition—Parian cement, lampblack, and alum—as a cement inlay in statuary marble to take a polish. This composition has not been a success, as not only no polished surface is obtainable, but the alum or some other ingredient has come to the surface.

Could you inform me how this rough and whitened surface could be made black, and if you could suggest a suitable composition for future use.

JOSEPH WHITEHEAD.

*** We are afraid that there is no efficient remedy, as the cement employed is unsuitable for the purpose, and nothing short of picking it out and substituting a better one will do any permanent good. The following will, we believe, be found to answer for the stopping:—Yellow wax, resin, and Burgundy pitch mixed with lamp-black, and made into a thick paste with a little sulphur and finely-sifted plaster. The proportions of wax and resin should be about equal, and the pitch and lamp-black should be added until the whole mixture is quite black. Another stopping may be made of six parts of sulphate of iron to one of rough saltpetre. This is exposed for twenty-four hours, then reduced to a powder, washed several times, and rolled into sticks for use. A little of this mixed with some lamp-black has been found useful. Of course, such stoppings are unsuitable for outdoor work.

The Student's Column.

3.—ARTIFICIAL BUILDING STONE; THE PRESERVATION OF STONE.

ARTIFICIAL stone has been used for building purposes from time immemorial. The ancient Egyptians used it in the form of concrete blocks composed of pebbles, broken stone, and lime. Concrete blocks were also extensively used by the Romans. The modern production of building stones of a finer grade, closely resembling those of natural origin, may be regarded as a natural development of the industry which commenced with the manufacture of concrete masses of various shapes and sizes for use as a substitute for blocks of natural stone.

The introduction of greatly improved crushing and grinding machinery, the progress in scientific knowledge, and the production of chemicals and high-grade cement at comparatively low cost has already resulted in the manufacture of building stones which compare favourably in many respects with some of the best stones from the quarries. The cost of producing good artificial stone until recently prevented its extensive use in mass; but for paving, for steps, for copings, and for the stone facings of brick buildings, it has long been successfully employed.

A natural prejudice against artificial stone has in the past prevented it from being gene-

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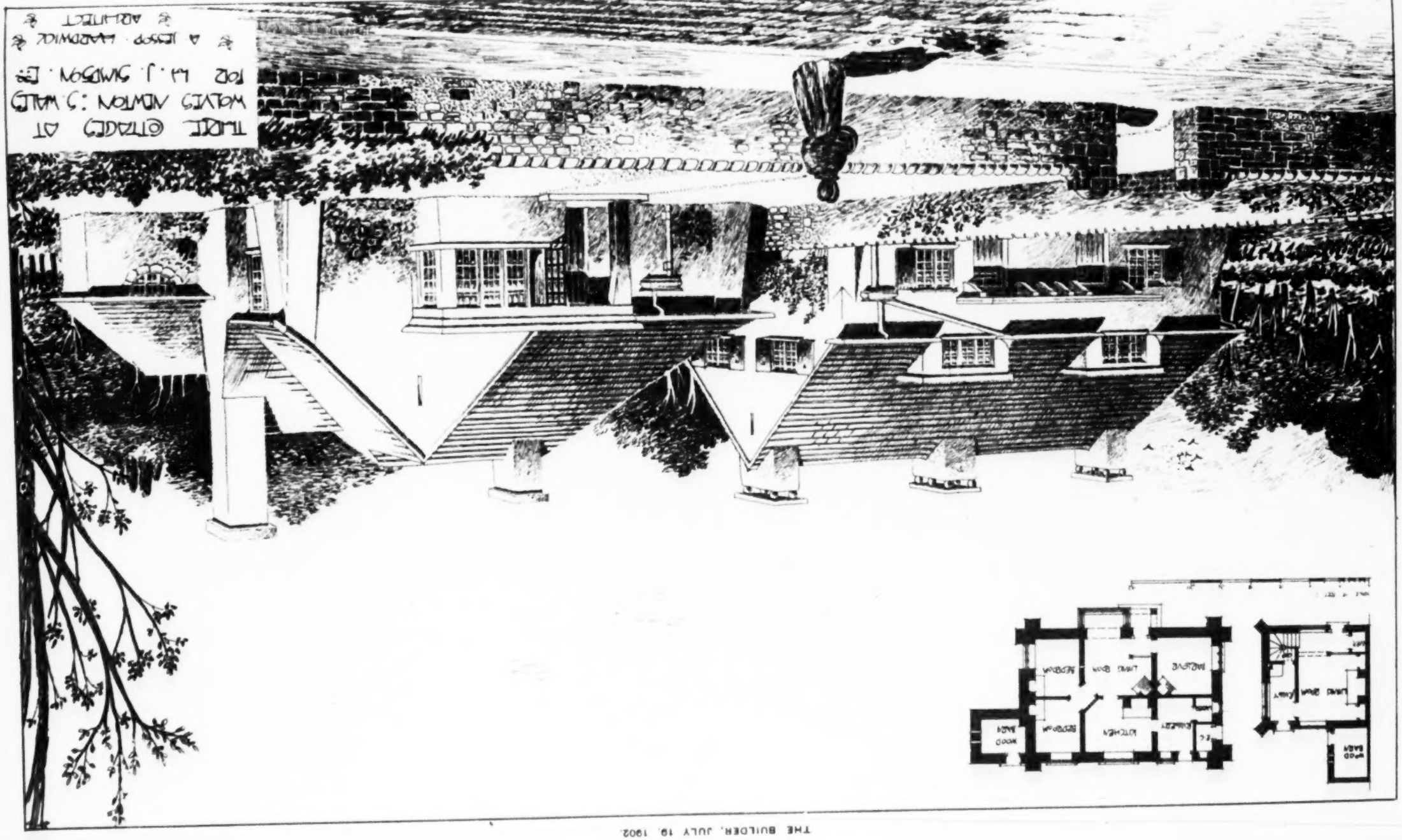
MONUMENT TO GOUNOD: TO BE ERECTED IN THE PARC MONCEAU, PARIS

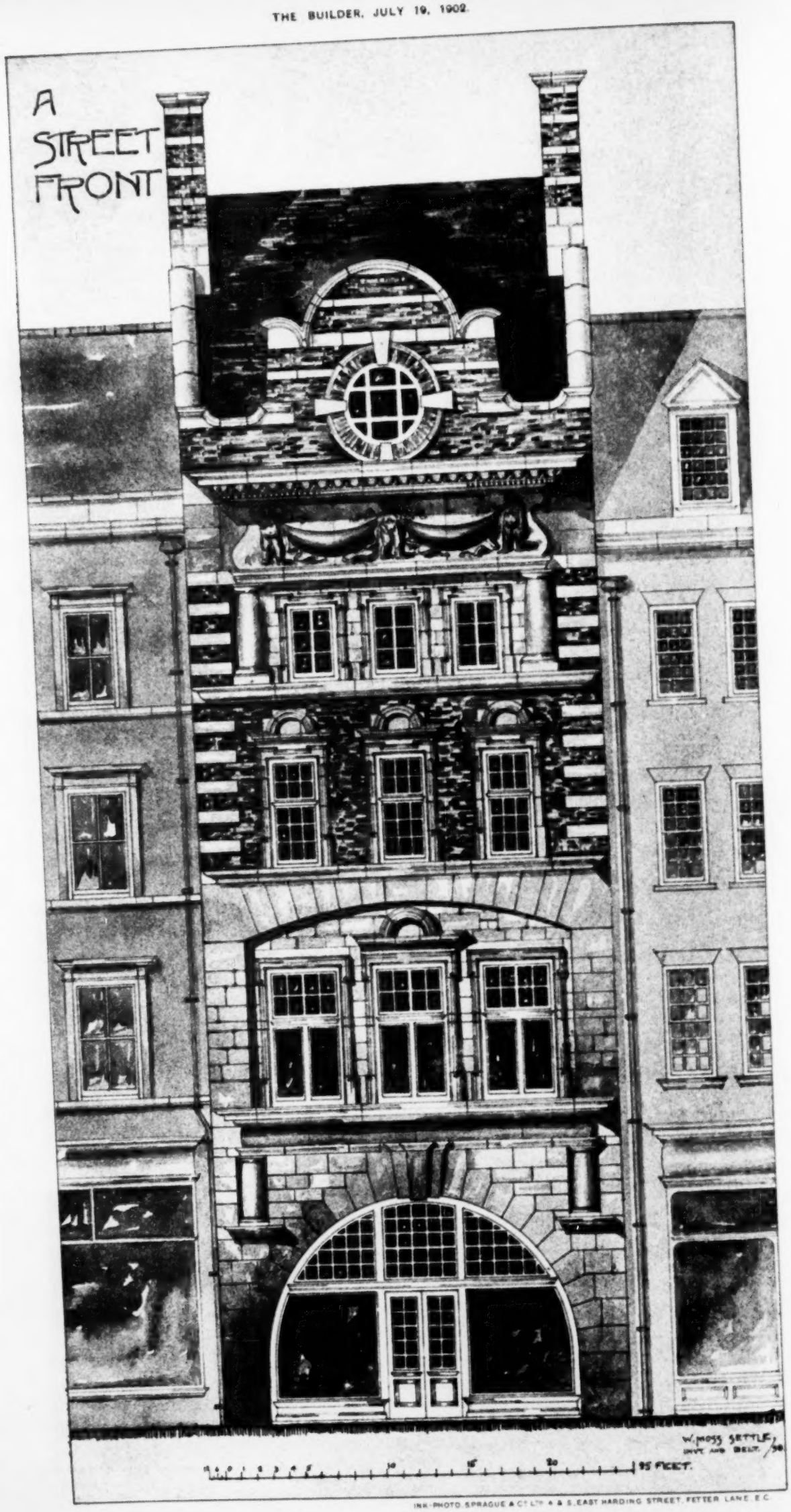
M. Mercié, Sculptor | M. Formigé, Architect

TUDOR GOTHIC AT WOLVES NEWTON : J. WALTER ROE & J. J. GIBSON, ESQRS. ARCHITECTS



STUDY COPY NOT FOR LOANS

A STREET FRONT



INK-PHOTO. SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

New Premises for S. C. LARKINS & SON.

Cannon Street Birmingham

Baldwin & Baldwin
Archts Birmingham
March 1902

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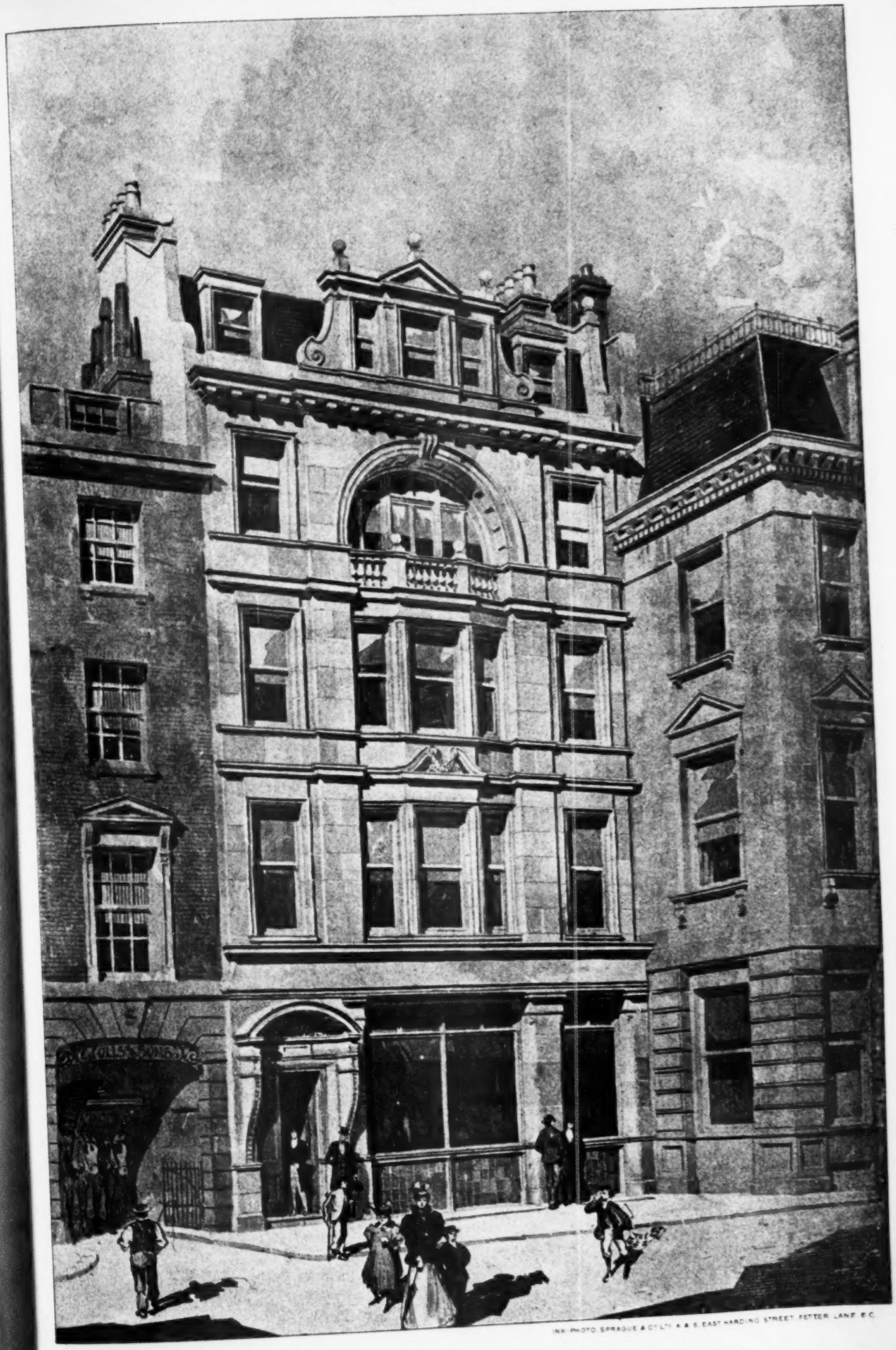

OFFICE BUILDINGS: 4 COLEMAN STREET, E.C.—MR. E. FLINT, F.R.I.B.A., ARCHITECT.

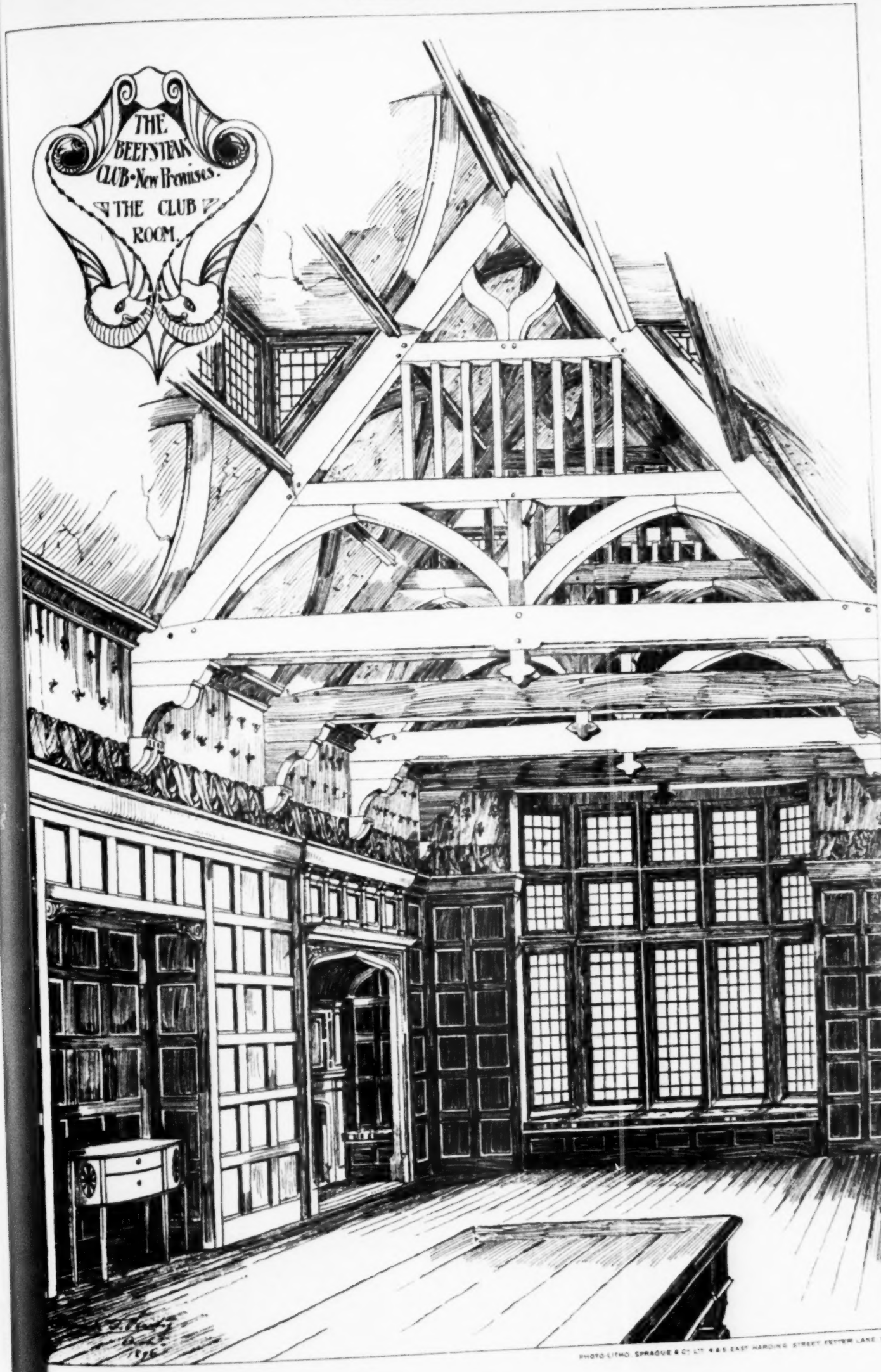

PHOTO-LITHO. SPRAGUE & Co LTD 4 & 5 EAST HARDING STREET FETTER LANE E.C.

rally used for important work, for builders have rightly preferred to employ stone which has been in good repute for centuries in preference to an artificial product of unknown value. The rapidly increasing production of the best forms of artificial stone proves, however, that this prejudice is being overcome.

A description of all the artificial stones invented during the last century cannot be given in these columns. The endless list of patentees of artificial stone affords evidence that the possibility of preparing an artificial product to compete with natural stone has been very widely recognised by many successive generations. Only a very small proportion of the inventions can, however, claim to have been of practical utility.

Victoria Stone.—The artificial product known as "Victoria Stone" is one of the stones most extensively used at the present time. It has been in use for some thirty years, and its production has gradually increased to an annual rate of about 15,000 tons, of which some 6,000 tons are used for architectural work, and the remainder mostly for paving.

Victoria stone is a mixture of crushed granite and Portland cement, which, after being moulded into blocks and hardened, is steeped in a solution of sodium silicate. Sodium silicate for stone manufacture is usually made by dissolving flint or a siliceous rock, such as Farnham stone, in caustic soda solution. Farnham stone is a natural rock containing about 40 per cent. of soluble silica, 15 per cent. alumina, and 45 per cent. quartz sand.

The granite employed is obtained from Groby, in Leicestershire, and, after being crushed to the required size, is carefully washed. Portland cement of the best quality is then mixed in the dry state with the crushed granite, and water is subsequently added until the mixture has assumed a suitable plastic condition. The mixture is then placed in moulds and allowed to set. The blocks, when sufficiently hard, are removed from the moulds and immersed for a number of days in a silicate bath. Finally, the blocks are taken out of the bath and exposed to the air for some time before they are permitted to leave the factory. During the process of manufacture the mixture can, of course, be treated with oxide of iron or any other suitable colouring matter to give the finished stone any desired tint.

According to Mr. Henry Reid, the composition of the granite employed, and of the finished artificial stone, is as follows :—

	Groby Granite.	Victoria Stone.
Silica (soluble) ...	0·55	50·35
„ (insoluble) ...	65·26	
Alumina	13·06	11·87
Lime...	4·55	18·33
Magnesia	1·01	2·03
Oxide of iron ...	9·81	7·33
Carbonic acid ...	0·03	1·80
Soda	2·34	3·81
Potash	2·85	1·78
Water, &c.	0·54	2·70
	100·00	100·00

The practical success of the stone is no doubt largely due to the care taken in its manufacture and in the testing of the raw materials, which result in practical uniformity of the finished stone in both chemical composition and physical properties.

Except in situations where the stone is subjected to severe concussion, as in yards where the unloading of vans is performed, the artificial stone is found to be as good a paving material as natural York stone, and is less costly.

Indurated Slabs are a cheaper form of artificial stone also made by the Victoria Stone Co. These slabs are, like Victoria Stone, made with crushed granite and Portland cement. They are, however, merely steeped in water instead of in a siliceous bath before being air-dried. The output of this stone is about the same as that of the more expensive Victoria Stone, viz., 15,000 tons per annum.

Ransome's Artificial Stone. — Ransome's siliceous stone was one of the first of the modern types of artificial stone to be extensively adopted for building purposes. It is said to have been used in St. Thomas's Hospital, the India Office, the London Docks, and other important buildings ; but, so far as we are aware, it is not now manufactured. The stone was produced by mixing sand with sodium silicate and a small proportion of powdered flint or chalk. The sodium silicate was at first made by boiling flints in caustic soda solution, but afterwards Farnham stone was used instead of flint. When the different substances had been thoroughly mixed in suitable proportions, the mixture was placed in moulds. The blocks thus formed were then treated with a cold solution of calcium chloride, and were subsequently immersed in a boiling solution of the same salt. Chemical reaction took place between the soluble silicate of soda and the soluble calcium chloride, and soluble sodium chloride and insoluble calcium silicate were formed. The calcium silicate formed in the interstices of the blocks rendered the blocks as hard and durable as natural stone of the best quality, and the soluble sodium chloride was subsequently removed by treatment with water.

"Non-slip" Stone.—The artificial product known as "non-slip" stone is made with cement and crushed York natural stone. The mixture is made plastic by the addition of water and is then placed in moulds and subjected to powerful hydraulic pressure. The slabs of stone thus manufactured are more uniform in size and are more durable than slabs of natural York stone. They are also less liable to assume a polished surface and to become slippery than stone made with granite. This stone is now used very extensively.

Stuart's Granolithic Stone. — This is a mixture of crushed granite and cement. It is frequently made *in situ*, that is to say, the mixture is prepared and laid in plastic condition on the spot where the stone is required, being used, in fact, like concrete. For paving, for tanks, and for dock work it has proved exceedingly successful.

Other Artificial Stones.—There are a number of other artificial stones in the market. They mostly consist, like those already mentioned, of a good hard natural stone crushed to a granular condition and cemented with Portland cement of the best quality. The hardening of the more expensive descriptions is usually completed by treating them with sodium silicate solution, but with the aid of pressure in the production of the stone very good building material can be manufactured without the use of the soluble silicate.

Moreau Imitation Marble.—The term "marble" should be applied only to limestones having a crystalline form resembling that of loaf sugar, *i.e.*, to limestones having a "saccharoid" structure. Moreau marble is merely ordinary amorphous limestone, such as Portland stone, so treated that its surface appears like that of polished marble. The stone is not converted from amorphous into crystalline limestone, and it is not therefore converted into marble. The Moreau process, as described in the patents granted in 1892, consists in the following treatment of stone :—

Masses of any white porous limestone are treated either in plain blocks, or after being carved to any desired form. First, varnish is applied to the surface of the stone in spots or streaks, the varnish consisting of "a mixture of turpentine, gum thus, and sesquioxide of iron or rouge de Prusse." Next, the stone is immersed in baths of sulphate of iron, sulphate of copper, and sulphate of zinc, the order of sequence and the time of immersion varying with the nature of the stone to be treated and the effect to be produced. The salts of iron and copper impart colour to the stone except where it is protected by the varnish. The stone is then placed in a bath of hot water, and subsequently in a bath of sulphate of zinc to harden it. Finally, the stone is dried and polished. In appearance and polish this substitute for marble compares favourably with the genuine material.

The hardening effect of the sulphate of zinc requires explanation. It is stated that a reaction occurs between the lime and zinc salts, carbonate of zinc and sulphate of lime being formed ; but this information does not explain the physical result, for zinc carbonate is not harder or more durable than calcium carbonate, nor sulphate of lime than carbonate of lime.

Artificial Marbles.—The so-called artificial marbles, such as "Scagliola" and "Marezzo," contain no marble, but are merely masses of white plaster treated with suitable colours. The plaster is polished by rubbing it with a hard fine-grained stone and with snake-stone, and finally with linen rag moistened with linseed oil. The plaster employed may be either plaster of Paris or Keene's cement. Keene's cement is made by mixing plaster of Paris with a solution of alum and heating the mixture to a suitable temperature. Keene's cement can be made to assume a very high polish, and is now most commonly used. Exposure to rain would, of course, soon cause disintegration of these plaster imitations of marble.

The Preservation of Stone.—In 1839 was issued the Report of the Commissioners charged with the selection of stone for building the new Houses of Parliament. In 1861 was issued the Report of a Committee appointed to report upon the cause of the decay of the new Houses. The Commissioners recommended that magnesian limestone, from Bolsover Moor and its neighbourhood, should be employed, and it was commonly thought when the Houses were being built that this stone was being used. When, therefore, the new Houses showed alarming signs of decay soon after their erection, scepticism was naturally aroused regarding the utility of science as set forth in the Commissioners' Report. The Committee of 1861 found, however, that although Bolsover stone had been specified in the contract for building the Houses, the stone actually used was, for the most part, an inferior stone from the Anston quarries, and that proper precautions had not been taken to ensure that only the best stone from the quarries should be used. It is now known that the greater portion of the stone is not so bad as was at one time feared, but the information collected by the Committee with reference to the best means of preserving stone renders the Report a document of great value, and those desiring to study the subject thoroughly will find a considerable number of proposed processes therein discussed.

It would serve no useful purpose to describe in these columns all the schemes, some ingenious and many foolish, which have been proposed for the preservation of stone, but the following brief summary of the prevailing ideas on the subject may be serviceable :—

1. It would probably be possible to treat individual blocks of an inferior stone with such success that they would resist atmospheric influences as well as any good natural stone, but no stone can be satisfactorily treated in a large building after the blocks have been fixed in position. The cost of the treatment would also materially increase the cost of the stone.

2. A solution of silicate of soda will harden most limestones owing to the formation of silicate of lime in the pores of the stone. The soda which is left in the stone after the silica of the sodium silicate has entered into combination with the lime appears as an efflorescence of sodium carbonate or sulphate on the surface of the stone, and is objectionable.

3. A solution of suitable gum resins in petroleum is to some extent serviceable when the stone can be first thoroughly cleaned and then treated until the stone has absorbed as much solution as possible.

4. Treatment with limewater is mere waste of time and money. The absurdity of limewashing was recently pointed out by Prof. Church in a discussion on a paper by Mr. Carõe before the Architectural Association (see the *Builder*, April 19, 1902).

5. Treatment with barium hydrate solution is preferable to treatment with lime water because sulphate of barium is insoluble in water, whereas sulphate of lime is soluble. It has been repeatedly proved that the action of the atmosphere is to convert carbonate of lime into sulphate of lime, and in the same way carbonate of barium, which is formed as soon as barium hydrate solution is exposed to the atmosphere, would be converted into sulphate of barium. It is only during recent years that barium hydrate has been produced at a sufficiently low price to render its use practicable, and it is still doubtful whether it is of much value as a preservative.

6. Processes involving the use of barium hydrate, followed by treatment with superphosphate of lime, are of little practical value.

LOCAL IMPROVEMENTS AT ASTON.—A site at Aston Cross for the proposed free library has been presented to the town by Messrs. Ansell, brewers. The building will cost an estimated sum of 2,000*l.*, with 150*l.* for its equipment. The Town Council propose, with the sanction of the Local Government Board, to borrow a capital sum of 52,436*l.* for the carrying out of their electrical lighting scheme, and have already, under a Tramways Order, begun the foundations of the generating station. An application has been made by the Council for a charter of incorporation.

OBITUARY.

MR. JOSEPH TALBOT.—We have to announce the death, on June 20, of Mr. John Joseph Talbot, a member of the firm of Messrs. Wilson & Talbot, of Commerce-court, Lord-street, Liverpool. Amongst the more recent architectural works carried out by him and his senior partner, Mr. W. G. Wilson, we may mention cottages at Port Sunlight for Messrs. Lever Brothers, of which we published an illustration, with a plan, in our number of February 24, 1900; the residence, Plymyard Park, Bromborough, in Cheshire, 1897 (Mr. J. J. Talbot); the gate, lodge, and stabling, Selkirk, on the Bridgelands Estate, for Mr. George Rodger Mr. W. G. Wilson); cottages at Woodchurch, Cheshire, and the new Unitarian Church, which has lately been erected in Bessborough-road, Oxton, to replace the former, and now demolished, Unitarian Church at Charing Cross, Birkenhead, 1901 (Mr. J. J. Talbot); the Liberal Club at New Ferry; a bungalow at Heswall; The Six Jolly Cricketers at Addington; and houses at Preston, and Alderley Edge, Cheshire. A drawing of the entrance front of the house at Bromborough is exhibited at the Royal Academy rooms this year.

GENERAL BUILDING NEWS.

CHURCH OF ST. LUKE, HORNSEY.—The foundation-stone has just been laid of a new church in Mayfield-road, Hornsey. The present effort is to build the first portion of the church, comprising the nave and aisle, with vestries underneath. Seating accommodation will be provided for 750 persons. The scheme will not be finished until a vicarage and church hall have been erected alongside the new building. The architects are Messrs. J. E. K. & J. P. Cutts, Southampton-street, Strand. The building contract is in the hands of Mr. S. J. Scott, of Walthamstow.

CONGREGATIONAL CHURCH SCHOOLS, BIRKENHEAD.—The memorial stone of the new school in connexion with Orton-road Congregational Church, Birkenhead, was laid on the 10th inst. The architect is Mr. J. H. Cook. The plans provide for a hall (to be used as the general schoolroom), nine classrooms, church parlour, and minister's vestry. A contract had been entered into for the erection of the building for the sum of 2,680*l*.

CHURCH, MORECAMBE.—New church and Sunday school buildings in connexion with the United Methodist Free Church at Sandylands were opened at Morecambe a few days ago. Mr. W. H. Dinsley, of Chorley, was the architect, and his plans were accepted in competition. The plan of the church is cruciform, with sitting accommodation for 370 on the ground floor, and for 330 in the gallery and orchestra. The schools are in two stories, and there is a church parlour, infant-room, and classrooms on the ground floor, and assembly-room above. Inclusive of the site the outlay has been 7,500*l*.

BETHEL NEW CHURCH, BRADFORD.—The memorial-stones were laid recently of Bethel new church and Sunday school, which are being erected on the site of the old iron church at the junction of Ryan-street and St. Stephen's-road, Bradford. The church will provide accommodation for 420 persons. The contractors for the various portions of the work are Messrs. J. Moulson & Sons, Mr. J. Bolton, Mr. T. Bolton, Mr. G. Wilkinson, and Mr. J. H. Sharp. Mr. W. S. Braithwaite, of Leeds, is the architect.

SCHOOLS, ST. HELENS.—The foundation-stone of new schools for the parish of Sutton, St. Helens, was laid recently on a site at Marshall's Cross. The new building when completed will accommodate about 120 children, and is being erected by Mr. W. Leicester, builder, Sutton, from plans prepared by Mr. F. Biram, architect, St. Helens. The site will allow an extension of the school premises when occasion requires.

MUNICIPAL BATHS, LIVERPOOL.—On the 7th inst. the Baths Committee of the Liverpool City Council opened a "People's Bath," in Beacon-street, in the north-end of the city, and laid the foundation-stone of new baths in Lister-drive, West Derby. At Beacon-street a shower and spray bath may be had for 1d., and a slipper bath for 2d. In September, 1899, the Engineer and Chief Superintendent (Mr. W. R. Court) prepared and submitted a report on the provision of "people's baths" as baths for the poor, and the Baths Committee approved of the report. The building as completed stands on an area of 450 square yards, and comprises seventeen shower and spray baths, and two ordinary slipper baths. The baths are arranged in sections, so that they may be used for males and females. Separate entrances are provided for both sexes, together with waiting-rooms, lavatories, and conveniences. The shower and spray baths are formed in cubicles in the bath hall, and constructed in slate. Each cubicle covers an area of 7 ft. by 3 ft. 6 in. It consists of a dressing-box and the shower and spray cabin; the dressing-box is provided with a seat, clothes-hooks, and foot-board. It is separated from the shower and spray cabin by a slate division, with passage opening having a waterproof curtain; the entrance from bath hall to dressing-box is also protected or screened by means of a curtain. The shower and spray cabin has a portion of its floor depressed, so as to form a foot-bath, the overflow of which is fixed at such a height as to allow the water to cover the bather's ankles. This allows the bather to soap himself and to wash his feet before using the warm spray bath or shower. The shower is placed overhead, and is formed in a circular ring, so that the water does not strike the bather's head, but falls on his shoulders. A small steam boiler is provided in the basement, which will supply the steam for calorifiers to maintain the warm water at a temperature of 95 deg. Fahr. It will also provide the steam for steam coils to drying-horses in laundry, and to the radiators for heating the bathing halls and waiting-rooms. There is a dwelling-house for the caretaker and his wife. A laundry is provided for towel washing. Messrs. Tomkinson & Sons were the contractors for the building work, Mr. Watkinson for the baths fittings, Messrs. Bradford & Co., for the engineering and laundry fittings, and Messrs. John Gibbs & Son for the atmospheric heating; the total cost being 3,500*l*., not including the cost of the site. The site in Lister-drive contains 6,500 sq. yds.; it has a frontage to Lister-drive of 226 ft. The buildings are set back 100 ft. from the line of the street, provision being made for one swimming bath 60 ft. by 30 ft., one swimming bath 75 ft. by 35 ft., and twenty-seven private baths. Space is also reserved for an additional swimming bath when required. The estimated cost of the establishment is 24,000*l*. The plans, &c., were prepared by the Baths Engineer, Mr. W. R. Court, Mr. Isaac Dilworth, of Wavertree, being the contractor.

TRURO CATHEDRAL.—Gratifying progress has been made with the vaulting of the nave of Truro Cathedral, which will probably be opened some time next summer. The fractures in the bases of the piers have not extended, and, as they now support considerably more weight than was the case twelve months ago, it is believed that they have found their bearings. Much of the scaffolding has been removed from the west side, revealing a handsome façade, in which there are a great rose window and lancet windows beneath. On the south side near the western end is a fine porch, now almost finished. There are eighty-eight niches and panels for figures and other sculptures on the west front and the south-west porch, and a scheme for filling these is being drawn up by a committee. Three or four panels or figures have been promised. Before the new portion of the building is dedicated, four of the lancet windows of the nave will be filled with stained glass already given. The main body of the workmen are just now engaged on the nave, and comparatively few are at work on the central tower. But shortly the tower will be crowned by a parapet, and the erection of the spire will then be commenced.—*Cornish Telegraph.*

INSTITUTE, NEWPORT, MON.—At the Technical Instruction Committee's meeting at Newport, recently, it was decided to proceed forthwith with the erection of the new Technical Institute, the site of which has already been secured and cleared in Clarence-place, and a committee was appointed to superintend the erection of the building, the plans for which have been prepared by Mr. Norman Brown, architect.

ASSEMBLY HALL, LIBRARY, BATHS, &C., BOOTLE.—The new Corporation buildings, which were opened at Bootle on the 27th ult., are situated on the north side of Marsh-lane, at its junction with Sandfield-place. The buildings comprise the following, viz., free public baths, gymnasium, North-end library, reading-room, and public assembly hall, the remainder of the site being laid out as a public garden. The bath block stands on the north and eastern boundaries of the site, and contains an open-air plunge bath 88 ft. 6 in. long by 30 ft. wide, surrounded by a continuous covered-in shed with seats for bathers. There is a soap bath in conjunction with the plunge, wherein children can be thoroughly cleansed before using the same. The gymnasium is situate on the north-east angle of the site, being 42 ft. long and 21 ft. 9 in. wide, furnished with gymnastic appliances, and is in close proximity to the plunge bath, having an entrance from the same and an exit door to the outside. Another feature of this block is the bathing-halls for males and females, in which a number of spray and slipper baths are being fitted up. There are separate entrances from Marsh-lane, passing through turnstiles on either side of the ticket hall to the respective waiting-rooms. The attendant's house is placed in a central position and immediately in front of the ticket hall. In the basement of this portion is fixed the steam-boiler necessary for the supply of patent beaters for the different baths. There are also cellars for fuel and stores. The public library, reading-room, and assembly hall block faces the front at the angle formed with Sandfield-place, the former rooms being placed on the ground floor. The library and reading-room are 40 ft. by 39 ft. 6 in., and the social room 27 ft. 6 in. by 24 ft., having a large bay window overlooking Sandfield-place. All the rooms on the ground floor are 15 ft. 6 in. high, and are entered from the Marsh-lane front. The public assembly hall forms the first floor of the above block, and occupies the whole area. The room is 62 ft. long by 40 ft. wide and 25 ft. high. It has a platform at the east end 13 ft. 6 in. in depth, with suitable retiring-room and conveniences. From the public entrance the hall is approached by a stone staircase 5 ft. wide, which is lined with glazed brick to a height of 4 ft. 6 in., the balustrade being of wrought iron of an ornamental character. There is also provided, at the platform end, an emergency staircase 3 ft. 6 in. wide, constructed of stone and made fireproof. The retaining walls and floor of the plunge bath have been executed with Portland cement concrete. All the other walls are built of brick, having dressings of red pressed brick and terra cotta. The whole of the principal fronts are faced with Ruabon pressed brick and terra cotta, the boundary walls being carried out with similar material. The principal joiner's work has been executed in selected pitch pine, the roofs being covered with slates. The roofs of the two towers are covered with zinc. Mr. Thomas Cox is the architect, and Mr. Peter Tyson, Liverpool, the contractor.

BUSINESS AND FACTORY PREMISES, HEANOR, DERBYSHIRE.—New premises for Messrs. I. & R. Morley are being erected at Heanor, in the High-street, opposite the present premises. The building will have a frontage to High-street of 30 ft., and will also be continued at the back of the present electrical power station. The first room will be the receiving and stocking-room, and will be 70 ft. by 30 ft. The next room is the mill, the dimensions of which will be 112 ft. by 40 ft. Following this is the drying apparatus. The last room of the block is the sorting-room, which fronts to High-street. Messrs. R. C. & E. R. Sutton, Nottingham, are the architects, and Messrs. Hopewell & Sons, of Basford, are building the premises.—Alongside the Great Northern Company's station excavations are proceeding for a new factory for Messrs. J. Fletcher & Sons, lace manufacturers, of Heanor. The factory will have a frontage to Derby-road of 141 ft., and will be 234 ft. in length. The outside walls will be 18 in. thick, with a 4-ft. bed of concrete. There are three shops, two 50 ft. across, and one 36 ft. Mr. Arthur Marshall, of Nottingham, is the architect, and Messrs. Williamson & Co., of Nottingham, are the contractors.

PAROCHIAL HALL AND INSTITUTE, ST. MARTIN'S, POTTERNEWTON, YORKSHIRE.—An addition is about to be made to the parochial institutions of St. Martin's, Potternewton, by the erection of a hall and institute, at a cost of between 3,000*l*. and 4,000*l*., from the plans of Mr. Percy Robinson, selected in a limited competition. Of Morley stone, the building will front into North-road, immediately opposite the church. The accommodation on the ground floor will comprise five classrooms, and lecture-room or gymnasium, 36 ft. by 26 ft. On the first floor there will be a hall, 80 ft. by 36 ft., which may be used for meetings, entertainments, and other purposes. The hall will be fitted up with a stage and dressing-rooms. A house for the caretaker also forms part of the main building.

MASONIC HALL, RIPON.—The foundation-stone of a new masonic hall to be built at Ripon was laid on the 11th inst. The new premises will occupy a position in Water Skellgate, and the plans of Mr. T. Wall, the architect, provide for a two-story brick building. The main entrance will be in stonework. A staircase hall, 16 ft. 6 in. long and 9 ft. 6 in. wide, will be divided from the vestibule by a glazed screen. The hall will be fitted up with lavatory and cloak accommodation, and it will have a mosaic tiled floor. On the first floor, which will be reached by a pitch-pine staircase, there will be an ante-room, 20 ft. by 11 ft., provided with a small private door from the Tyler's lobby, which will shut off the landing from the lodgeroom. The latter room will be 33 ft. long by 21 ft. wide and 19 ft. high, and will have a domed ceiling. Boyle's air-pump ventilator will be used in the roof. The floor will be in maple, and at the east end of the room will be a raised dais, having as a background a high dado, with circular cornice. Adjoining the lodgeroom will be the Tyler's storeroom, 11 ft. long by 4 ft. wide. There will be another room, 17 ft. by 15 ft., entered from the landing. On the ground floor there will be a dining-room, 22 ft. by 21 ft. This will be entered from the vestibule through a lounge. Attached to the dining-room will be a service-room and kitchen, and between the dining-room and the hall will be a smokeroom, 16 ft. by 11 ft. The woodwork throughout, except the lodgeroom, will be in pitch-pine and varnished. The lodgeroom will be in deal, finished in white enamel. The surplus space on the ground floor will be devoted to the construction of a lock-up shop, 25 ft. by 16 ft., having windows into High and Water Skellgates. The contractors are: Messrs. Mitchell & Webster, Ripon, excavators, masons, and bricklayers; Messrs. Clapham & Taylor, Harrogate, carpenters and joiners; Mr. W. E. Dixon, Ripon, plumber and glazier; Messrs. Coleman Bros., Knaresborough, plasterers; and Messrs. J. Baynes and C. Beck, Ripon, slaters.

TOWER, ST. SIDWELL'S, EXETER.—The Bishop of Exeter (Dr. Ryle) re-dedicated on the 15th inst. the tower of St. Sidwell's, Exeter. Of the earlier churches upon the site little is known, but it is on record that the fifteenth century tower was damaged, and the upper portion totally destroyed, by an explosion of some gunpowder stored therein during the 1549 rebellion. St. Sidwell's was first mentioned in a deed o 1199, and was rebuilt in 1437. The Royalists used the tower as a prison, and it was during the religious troubles preceding the Reformation that Walter Raleigh, father of the

great Raleigh, was confined within the tower. Previous to its destruction by the explosion the tower and the exterior church were of red sandstone, perhaps better known as Heavitree stone. The ruined portions of the tower were repaired in 1606, local bricks being used. At a later period the unsightly brick was plastered with cement. Having fallen into decay, the general fabric of the church was rebuilt, but the north and south early fifteenth century arcades of Beer stone and the tower were preserved. To the tower was added a spire of an unusual construction. It was framed of deal, boarded and covered by sheet copper, removed from the bottom of one of Nelson's men-of-war, which had been broken up at Devonport Dockyard. There were also small pinnacles, and these, with the monarch spire rearing its head above, bore "the battle of the breeze" for many a year. Mr. E. H. Harbottle, architect, condemned the spire and pinnacles as unsafe, and their removal was effected without the aid of scaffolding within seven days. Mr. Harbottle prepared a design in which he preserved the fifteenth century style, and now the tower of St. Sidwell's stands in all its glory as of old. The addition to the tower has cost nearly 3,000*l.*, and has been effected by the feoffees of the parish lands, under the sanction of the Charity Commissioners. The west window and entrance have been enlarged and beautified. Perhaps the great interesting relic of the tower is the vane—"a rare and fine bird," presented the patrons of St. Sidwell's by the Dean and Chapter of Exeter, as a terminal for the spire when that erection sprung up from the tower. This ancient vane and its chanticleer once formed the cathedral's weathercock. It was first erected on the cathedral spire in 1484, and served for 268 years. Then it crowned St. Sidwell's tower for eighty-seven years. It has been replaced on the tower.—*Western Morning News.*

SANITARY AND ENGINEERING NEWS.

WATER WORKS, MERTHYR.—The Upper Neuadd reservoir of the Merthyr Urban District Council was opened recently. The new reservoir has cost 138,000*l.* It has a top water surface of 59 acres, and contains when full 350,000,000 gallons of water. Mr. G. F. Deacon was the consulting engineer.

PROPOSED TUNNEL UNDER THE RIVER ST. LAWRENCE.—According to the Canadian papers, Mr. C. W. Emerson, of Boston, Chief Engineer of the Montreal Subway Company, arrived in Montreal recently to start borings and surveys for the proposed tunnel under the St. Lawrence, from the south shore at Longueuil, under St. Helen's Island, and into Montreal. In the course of an interview, Mr. Emerson said that the new tunnel will be larger than any in the United States, as its dimensions are to be 27 ft. wide and 21 ft. high. It is expected that it will be necessary to tunnel 4,000 ft. under water and 5,000 ft. inland. The structure will be concrete and masonry lined with enamelled brick. The shafts will be lighted by electricity. The provisional directors of the company believe that the tunnel can be constructed for 2,000,000 dols.

FOREIGN.

FRANCE.—The drawings sent in by the students of the Villa Medici have been exhibited at the Ecole des Beaux-Arts. In architecture M. Bigot, a first-year pupil, sends a drawing of an ancient capital in the church of Sta. Maria in Trastevere; M. Garnier, a second-year pupil, sends a drawing of the arch of Titus and the church of Sta. Maria at Rome. M. Chiffeot, a third-year man, sends a restoration of a Pompeian house; and M. Dufresne, in his fourth year of residence, sends a complete restoration of the Thermæ of Caracalla.——M. Moncel, the sculptor, has been commissioned by the Government to execute a bust of Madame Alboni, to be placed in the Opera House.——The Municipality of Caen has voted a sum of more than 3,000,000 fr. for extensive public works, especially the reconstruction of the on the canal between Caen and the sea, and the improvement of the port of Ouistreham.——A statue of General Hoche is to be inaugurated at Quiberon on the 20th.——The Department of Fine Arts has voted a special fund for the restoration of two monuments of interest at Autun, the Porte St. André and the Porte d'Arroux.——The Conseil-Général of the Seine has decided on the establishment of a school of "Arts et Métiers" at Paris, on a site facing the Boulevard de l'Hôpital, for which 1,600,000 fr. has been paid, independent of the cost of the building.——The Académie des Beaux-Arts has awarded the Nicolas Bailly prize to M. Guadet, the eminent architect.——MM. Chaussemiche, Gerhardt, and Ballu have been elected members of the Jury of Architecture of the Ecole des Beaux-Arts for a year, in place of MM. Tournaire, Eustache, and Corroyer. M. Girault has been elected a prominent member of the same jury.——M. Formigé is carrying out at present the construction of terraces and balustrades on the Esplanade des Invalides, to right and left of the central avenue, over the two spaces which give light to the railway station. The cost will be about 600,000 francs.——The Municipal Council of Paris has recognised the necessity of rebuilding, as soon as possible, the hospitals named Saint Louis, Cochin, and La Pitié. The scheme will mean an expenditure of about 70,000,000 francs.——M. Maurice Delarue has left to the Société Centrale des Architects a sum to found a biennial prize to be awarded to the author (not being a Prix de Rome man) of the best work in civil, domestic, or religious architecture executed during the five years previous to the award of the prize.——The new mairie of the XVIIIth Arrondissement, commenced many years ago from the designs of M. Varcollier, is now to be completed.——The Government has authorised the construction of two viaducts over the Seine for the Metropolitan Railway, one at Passy, the other by the side of the Pont d'Austerlitz. The first named, the design of which is to be by M. Formige, will be of steel and in two stages, like the Point du Jour viaduct.——M. Denys Puech has completed the monument to Gavarni to be erected on the Place St. Georges. It will occupy the centre of the existing circular basin, and will consist of a gilt bronze bust of Gavarni on a marble pedestal, around which are figures in relief symbolising the principal works of the celebrated caricaturist.

NEW BUILDINGS IN HAVANA.—The Academia de Ciencias, Havana, has been opened after important additions to improve the library accommodation for a school of architecture, engineering, and the kindred sciences. The new parts consist of an entrance-hall; on either side are libraries on the first floor, one for study, one for reference, and one for general reading of scientific periodicals, &c. On the second floor are a large meeting-room, laboratories, open galleries, &c. The new buildings are furnished with electric light. The contractors were Messrs. James B. Clow & Sons, of Havana, New York, and Chicago. The architect is Mr. James S. Angus Mercer.——In the same town and by the same architect the Escuela de Artes y Oficios has also been completed. This building is two stories of 20 ft. to each floor, and is fireproof, and arched with brick arches, concrete, and finished with tile floors. The exterior is in a phase of French Renaissance, and there is a clock tower on the principal façade.

RUSSIA.—Russian art has sustained a heavy loss by the death of the sculptor, Autobolsky, a member of the St. Petersburg Academy. His most important works were "Peter the Great," "The Dying Socrates," and "The Fettered Christ before the People."

GERMANY.—The German Admiralty has purchased a site in the Bellevue-strasse, close to the Potsdamer-platz, in Berlin, for six million marks, with a view of building a new Admiralty office, so that all the Navy bureaux—which are at present scattered—can be accommodated under one roof.

AUSTRALASIA.—The Tivoli Hotel, Sydney, is about to be greatly enlarged, Messrs. Backhouse & Backhouse, of that city, are the architects.——Municipal buildings are about to be erected at Moree from designs by Mr. G. L. Grant, of Pitt-street, Sydney.——As a result of the recent convention of the Federated Master Builders' Association of Australasia, held in Sydney, technical education is to be more rigidly insisted upon in the building trades, and examinations are contemplated. It is stated that the apprenticeship system has practically died out in the colony.——A beautiful red marble has recently been found and opened up at Borenore, near Molong, in New South Wales. Blocks up to four tons are obtainable.——A large hotel is to be erected at Christchurch, New Zealand, at a cost of 23,000*l.* Mr. E. S. Lutterel, of that city, is the architect.——The Wellington (New Zealand) City Council has decided to erect a new town hall.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. John King, Limited, warming and ventilating engineers, Liverpool, have opened London offices at 7, Quality-court, Chancery-lane.——Messrs. Archibald Dawnay & Sons, engineers (London and Cardiff), have appointed Mr. Hilliard Stephens, of 39, Victoria-street, Westminster, as their agent for the Metropolitan district.

FIRE TESTS WITH DOORS.—The British Fir Prevention Committee again undertook two test with fire-resisting doors on the 9th inst. at their Testing Station, Bayswater, when wood doors, protected with uralite slabs, were under investigation. There was a large attendance of visitors, who were received by Mr. Edwin O. Sachs, Chairman, and Mr. Ellis Marsland, Hon. Secretary, and among the party were the official representatives from the War Office, Admiralty, several Government Departments, and the leading Insurance, Railway, and Shipping Companies. In the one case, the door was protected by uralite slabs alone, and in the other case, by uralite slabs and light metal sheeting. The duration of the test was one hour and a half, at temperatures rising to 1,800 deg. Fahr., and although the smoke passed through the joints between the doors and the frames, and the fire side of the doors was badly injured, the fire did not pass through the doors. The official report will be issued in due course.

PUBLIC PARK, VALE OF LEVEN.—The new public park given by Mr. John Christie, of Gallangad, to the inhabitants of the Vale of Leven, has just been formally opened. The park, which is about 14 acres in area, is situate at the north end of Alexandria, with a front entrance from Main-street and a side entrance from Middleton-street. A white stone lodge, which comprises keeper's house and public rooms, from designs of Mr. J. Miller, architect, Glasgow, has been erected at the main entrance. There is also a bandstand and fountain. The ground has been laid out by Mr. Leitch, Rothesay, from designs by Mr. Whitton, Superintendent of Parks, Glasgow.

REGISTRATION OF PLUMBERS.—Nineteen master and operative plumbers, applying for registration under the National Registration of Plumbers, attended at King's College for examination a few days since by the Worshipful Company of Plumbers. The candidates were from various parts of London, and also from Bedford, Egham, Redhill, Rochester, and Saffron Walden. The practical test included lead-bossing and the making of plumbers' joints, &c. The examination questions included the subjects of contamination of drinking water from faulty connexions, roof-covering, arrangement of bath, sink, and closet waste, drainage of town houses, and disconnexion with sewers. The examiners were Mr. Charles Hudson, master plumber, Chairman of Board of Examiners; Mr. J. Knight, master plumber; and Messrs. F. Oakes and G. Wilson, representing the United Operative Plumbers' Association of Great Britain and Ireland. Nine candidates succeeded in passing the examination.

NELSON-SQUARE, BLACKFRIARS-ROAD.—The owners and tenants of Nelson-square have under their consideration the ratification of a scheme for the permanent acquisition and up-keep of the garden of the square as an open space for public recreation and enjoyment. The conditions are that Lord Halifax shall effect a conveyance in favour of the Southwark Borough Council, and that the owners and occupiers shall relinquish their rights in the square and its garden, and contribute one half of the estimated cost, which amounts to 2,800*l.*, of making-up and paving the roadway and footpaths. Their several contributions are to be assessed at so much per foot-frontage of their respective premises, and the footpaths and roadway will be made-up and maintained at the public expense.

CEMENT IN THE CANARY ISLES.—Mr. Croker, British Consul in the Canary Islands, reports that the increasing demand there for cement was met last year chiefly by Belgian shippers. The imports from Belgium rose from 1,113 tons in 1900 to 2,120 tons in 1901. British shippers, however, secured a share of the business, sending some 500 tons, and if they could keep down the price, even were it only to the level of that asked by their neighbours, more of it would fall to their share. Shipments from France fell away to some extent, but she sent more than the United Kingdom.

METROPOLITAN ASYLUMS BOARD.—At a meeting of the Metropolitan Asylums Board on Saturday last week, the Works Committee reported that in view of the adjournment of the Board, and the desirability of obtaining tenders for works at the earliest possible date, they had appointed the following firms of quantity surveyors to take out the quantities of the undermentioned works at a commission, in each instance, at the rate of 1½ per cent. upon the amounts of the accepted tenders, viz.:—Messrs. John Leaning & Sons, John-street, Bedford-row, W.C., additional accommodation for female staff and sanitary annexes at Caterham Asylum (estimated cost, 5,000*l.*); Messrs. W. H. Barber & Son, Buckingham-street, Adelphi, W.C., cottages for married attendants at Leavesden Asylum (estimated cost, 5,250*l.*); Messrs. Fowler & Hugman, Craig's-court, Charing Cross, W.C., receiving home for children and stable buildings at the Tooting Bec Asylum (estimated cost, 15,465*l.*).

QUEEN VICTORIA STATUE, CARLISLE.—A monument erected by the citizens of Carlisle to the memory of Queen Victoria in their Public Park has just been unveiled by His Royal Highness Prince Christian of Schleswig-Holstein. A short time after the death of the late Queen the Town Council resolved to perpetuate the memory of her Majesty by erecting a bronze statue upon some suitable site within the city. They arranged with Mr. Thomas Brock to provide a replica of the statue which he had just executed for Hove, Brighton, as a Diamond Jubilee memorial. A site in the Public Park was approved by Mr. Brock and adopted by the Corporation. The statue, which is 13 ft. high and cast in bronze, represents her Majesty in Imperial robes over bodice and skirt, wearing an Imperial crown. In one hand she holds an orb surmounted by a figure of Victory, and in the other a sceptre. The panels on the die of the pedestal, which are of bronze, represent Empire, Education, Science and Art, and Commerce. The statue stands on a pedestal of Aberdeen grey granite, and the pedestal itself has been placed on three steps of the same stone. The pedestal, which is 15 ft. high, was supplied by Mr. Taylor, of Aberdeen. The concrete foundations were laid by the Corporation workmen under the direction of Mr. Marks, the City Surveyor.

ADMIRALTY BUILDINGS ARBITRATION.—The dispute between the contractors and the Office of Works with respect to certain extras incurred by the contractors in the erection of the new Admiralty buildings, was the subject of an arbitration inquiry opened before Mr. E. A. Gruning on the 10th inst. at the Surveyors' Institution. The contractors, Messrs. Chessum & Sons, were represented by Mr.

Cripps, K.C., and Mr. Hudson, and the Office of Works by Sir Robert Finlay (the Attorney-General) and Mr. Askwith. Mr. Cripps, in opening the case for the contractors, pointed out that the difficulties between the parties had reference to the shoring-up of the old Admiralty buildings, and to questions of foundations and underpinning. The contract was a lump sum contract, and there were certain provisions for ascertaining what should be paid to the contractors if they incurred extra cost in carrying out the works. It was for the arbitrator to say what sum should thus be allowed. The shoring-up of the old building had to be carried to a greater depth than was shown on the contract plans, and owing to the extra depth to which the foundations of the new buildings had to be taken, the character of the timber from top to bottom had to be altogether altered. With regard to the underpinning of the old buildings, Messrs. Chessum were called on to do the work on the principle of short lengths, and therefore the lump sum price applicable to short length work was not applicable to the work which had actually been done. Owing to the extra depth of the foundations, very difficult excavation and piling was rendered necessary. Mr. R. Chessum, of the contracting firm, stated that the tender for the execution of the work amounted to 15,596*l*. At one point witness explained they had to carry the foundations to an extra depth of between 10 ft. and 11 ft., and this was due entirely to water, which had to be pumped away. The whole of the soil below the contract depth was water-bearing. After detailing the extra work done, witness informed the arbitrator that he was instructed to do it by the clerk of works and by Messrs. Leeming & Leeming. The hearing was adjourned.

THE SANITARY INSTITUTE CONGRESS.—The preliminary programme of the nineteenth Congress, to be held in Manchester, from September 9 to 13, has now been issued. Earl Egerton of Tatton is the President. Mr. W. N. Shaw, F.R.S., will deliver the lecture to the Congress, and Sir W. J. Collins, M.D., Member of the London County Council, will deliver the popular lecture. Excursions to places of interest in connexion with sanitation, and a conversazione, will be arranged for those attending the Congress. Over 300 authorities, including several County Councils, have already appointed delegates to the Congress, and, as there are also over 2,500 members and associates in the Institute, there will probably be a large attendance in addition to the local members of the Congress. In connexion with the Congress, a Health Exhibition of Apparatus and Appliances relating to health and domestic use will be held, as a practical illustration of the application and carrying out of the principles and methods discussed at the meetings. The Congress will include three general addresses and lectures; three sections meeting for two days each, dealing with (1) Sanitary Science and Preventive Medicine, presided over by Sir James Crichton-Browne; (2) Engineering and Architecture, presided over by Sir Alexander Binnie; (3) Physics, Chemistry, and Biology, presided over by Professor A. Sheridan Delepine. Eight special conferences as follows:—"Municipal Representatives," presided over by Alderman Alex. McDougall, Vice-Chairman of the Health Committee, Manchester; "Port Sanitary Authorities" (Alderman Walton Smith, Chairman of Manchester Port S.A.); "Medical Officers of Health" (Mr. James Niven); "Engineers and Surveyors to County and other Sanitary Authorities" (Mr. Charles Jones); "Veterinary Inspectors" (Mr. W. Augustus Taylor); "Sanitary Inspectors" (Mr. W. Bland, Sanitary Inspector, Barton-upon-Irwell); "Domestic Hygiene" (Mrs. W. O. Meek); "Hygiene of School Life" (Professor C. S. Sherrington). The local arrangements are in the hands of a local committee, presided over by the Lord Mayor of Manchester, with Mr. J. H. Reynolds, Principal of the Municipal School of Technology, as Honorary Secretary.

LEGAL.

DISPUTE BETWEEN ELECTRICAL ENGINEERS.

THE hearing of the case of Bunce *v.* W. A. S. Benson & Co., Ltd., was concluded on the 10th inst. before Mr. Justice Ridley and a special jury.

In this case Mr. Edward George Bunce, an electrical engineer, trading as Bunce & Co., at Nottingham-street, W., sought to recover damages for alleged libel from the defendants, electrical engineers, of 82 and 83, New Bond-street, W.

It appeared that in June, 1901, the plaintiff was employed as electrical engineer by a firm known as Messrs. Elliott, Son, & Boyton, to do certain work in connexion with the installation of electric light at No. 80, Gloucester-place, W. In September of that year the defendants, who had been engaged by a Mr. Eckersley, a gentleman who had become tenant of the house through Messrs. Elliot, Son, & Boyton, to put fittings on the wiring work which the plaintiff had done, made the following report to Mr. Eckersley:—"Report of existing electric light wiring at 80, Gloucester-place, W. The house, which has been wired for some seventy-five points, or say eighty-five lights, is, we find, provided with only six double pole fuses to protect these. This is not in conformity with the Metropolitan company's rules, and may be objected to by them. The system of distributing employed will necessitate the use of fuses in ceiling roses and wall plugs, a not very satisfactory arrangement, and one which has been discontinued for some time by most contractors. Owing to the manner in which the fuse-board has been connected up, the failure of one particular fuse would extinguish no less than twenty-five lights, probably putting two floors in complete darkness. There is, of course, no great harm in this, but the inconvenience caused will be readily appreciated. We certainly think that this fuse-board ought to be taken down, and the wires sorted out and connected up in their proper order . . . The following work which we have noticed does not satisfy the requirements of the fire insurance companies:—Wires under floors, in partitions, behind skirtings run without covering of wood casing or metal tubes; joints between wires merely twisted up and given two or three laps of tape, no solder used. —(Signed) W. A. S. Benson & Co., Ltd.; C. J. Scott, Electrical Manager." The plaintiff alleged that this report was a libel upon him in his business, the innuendo being that the work at the house had been done in an inefficient manner, and that the house might easily take fire owing to the improper workmanship. He alleged that he had by the report been greatly injured in his credit and reputation as an electrical engineer, and accordingly claimed damages.

The defendants denied that the report bore the meaning alleged, or that it was libellous of the plaintiff. They also said that it was true in substance and in fact.

Mr. R. A. McCall, K.C., and Mr. Clarke Hall appeared for the plaintiff, and Mr. J. Eldon Bankes, K.C., and Mr. Boydell Houghton for the defendants.

Mr. McCall, in opening the case, said that the plaintiff had had a large experience since he commenced practice as an electrical engineer in 1897, and he had done a large amount of business with the well-known firm of house agents, Messrs. Elliot, Son, & Boyton. These people had through their hands in the course of every year a large number of houses, and when it was necessary to put in electric fittings they had employed the plaintiff to do it. In May or June of last year they employed him to fit up the house No. 80, Gloucester-place, with wires. Plaintiff gave his estimate, which was accepted, and he did the work. The house was wired and it was left to the incoming tenant, Mr. Eckersley, to put in the necessary fittings. Defendants sent their man, who made a cursory examination, and on the strength of that made the report complained of on the nature of the work done by the plaintiff. That report the plaintiff said was not only impertinent, but untrue, and reflected seriously upon his reputation.

Mr. Edward George Bunce, the plaintiff, examined, said he was an electrical engineer, the defendants being also well-known electrical engineers. For the past five years he was constantly doing business with Messrs. Elliot & Co. Last year he received a letter from them asking for an estimate for the wiring of No. 80, Gloucester-place. He sent in an estimate, and was engaged to do the work. The wires were put in wood casing under the floors, and in steel conduits up the walls. On September 13, when the report in question was made, the wiring was completed, but no switches were fixed anywhere. At that date another fuse-board had to be fixed in the place of another which was to be taken away. Apart from that the rest of the work was finished. On September 16 he received a letter from Messrs. Elliot & Co. enclosing a copy of the report he complained of. He was not aware until he received a copy of the report that the defendants had made an inspection of the premises. He went with a man to the house next day to see what had been done. The boards on two floors only had been taken up. Without removing the floor boards, it was impossible for anybody to see whether the wires were cased or not. The skirtings had not been removed. He did not find that any of the wires under the floors, or behind the skirtings, or up the walls, had been altered in any way. The wires left by him had been passed by the Metropolitan Electric Supply Co. Messrs. Elliot had paid him for the work. On November 19 he had an interview with Mr. Scott, representing the defendants, at his solicitor's office. His solicitor explained to Scott the serious nature of the libel, and told him that if he went home and wrote a letter to Messrs. Elliot & Co., and Mr. Eckersley, saying there was no foundation for the report, there would be an end to the case. Scott promised to do this, but demurred to paying his solicitor's costs, then amounting to about 3*l*. 3*s*. So far as he knew Scott had not written the letter, and there had been no apology.

Cross-examined by Mr. Bankes.

He kept at the work till July, and on July 5 the wiring was substantially finished. On July 11 his man put in a 6-circuit distributing board. Between August 2 and September 20 none of his men were in the house at all. There was nothing in the house to indicate that he had wired it. He admitted that the first distributing board put in was wrong, and after the report he put in another—an 8-circuit board. The wrong board was put in through the mistake and fault of a clerk. He wrote to Messrs. Elliot & Co. and told them that he had not completed his contract when defendants went to the house, and that was true. It was quite true that the defendants, directly they heard that the work was not finished, sent to Messrs. Elliott & Co. and said that as he (plaintiff) had not finished the work, he had better do so, and not they, and that they would withdraw their report. He had no complaint to make of that, but he did particularly complain of the statement in the report that the joints had not been properly soldered. They were properly soldered.

His Lordship stated that he could not see where the libel was.

Mr. McCall said that the report cast a very serious reflection upon the plaintiff.

In the result Mr. McCall stated that he was glad to say that the parties had come to terms, and it would not be necessary to trouble his Lordship or the jury further with the case. It had been arranged that the record should be withdrawn, the plaintiff agreeing to pay one-half of the defendants' taxed costs of the action on defendants stating that they laid no personal blame on the plaintiff for what had happened.

Mr. Bankes said that his clients had no wish to be hard on the plaintiff. The defendants had never blamed plaintiff personally for what had happened.

His lordship concurred in thinking that no personal blame at all attached to the plaintiff.

The record was then withdrawn on the terms tated.

SUSSEX DRAINAGE DISPUTE.

THE case of the Mayor, &c., of Hove *v.* the Brighton Intercepting and Outfall Sewers Board came before Mr. Justice Kekewich in the Chancery Division last week, an action by the plaintiffs against the defendants, claiming a declaration that plaintiffs were entitled to discharge, and that the defendant board were bound to admit into the defendants' intercepting sewers, all the sewage of the Borough of Hove, including the sewage of that part of the borough which was within the parish of Aldrington, and an injunction to restrain the defendants from excluding the plaintiffs from the exercise of the above right. The intercepting sewers which run along the front of Brighton and part of Hove, from Cliftonville to the outfall at Portobello, were constructed under an Act passed in 1870, which was an Act for making intercepting and outfall sewers from Brighton and the adjoining district (part of the district which afterwards became the urban district of Hove), then under the jurisdiction of the West Hove Commissioners and the Brunswick Square and Terrace Commissioners, and which Act vested such sewers in a representative sewers board. The plaintiffs' case was that by virtue of the Hove Commissioners Act, 1873, and an order of the County Councils of East and West Sussex made in 1890, under the provisions of the Local Government Act, 1888, which provided that the area of the parish of Aldrington should be transferred from the rural sanitary district of the Steyning Union and form part of the urban sanitary district of the town of Hove, and that the Hove Commissioners Act should be read as if the words "the parishes of Hove and Aldrington" were inserted instead of the words "the parish of Hove," the plaintiffs were entitled to bring the drainage of Aldrington, which was not originally a district within the purview of the Sewers Act of 1870, either directly by means of openings into it, or indirectly through their own sewers into the intercepting sewers of the Board. The plaintiffs claimed further that under Section 36 of the Act of 1870 they had a right, irrespective of whether Aldrington was part of the district of Hove or not, to insist upon the admission of such sewage into the defendants' intercepting sewers on payment of compensation, as being a place lying beyond the limits of the Local Authority therein mentioned. The defence, shortly, was that Aldrington was not entitled, as part of the district of Hove, and of right, to the benefits of the Act of 1870; and that Section 36 had no application to the case.

In the result the action was dismissed, with costs.

Mr. Macmorran, K.C., and Mr. R. J. Parker appeared for the plaintiffs; and Mr. Cripps, K.C., Mr. Boxall, K.C., and Mr. Manby for the defendants.

WORKMEN'S COMPENSATION ACT.

WHAT IS A "SCAFFOLD" AND WHAT IS "REPAIRING?"

A CASE came before Judge Stonor on Friday last week, at Brompton County Court. William Pinnock, a house painter, Alderville-road, Fulham, S.W., applied under the Workmen's Compensation Act for compensation against Mr. Joseph Welch, builder and decorator, Harwood-road, Fulham, the claim being in respect of personal injuries said to have been sustained by the applicant whilst in the respondent's employment.

Mr. J. Gibson, solicitor, appeared for the applicant, and Mr. E. F. Leaver, counsel, for the respondent.

Applicant's solicitor explained that on April 10 last his client was in the respondent's employment, assisting in washing down walls and whitewashing ceilings at a house in Waterford-road, Fulham. In order to reach his work, the man was obliged to

form a sort of scaffold, by resting a scaffold board upon two pairs of ordinary builders' steps, one pair standing at each side of one of the rooms. It appeared that while the applicant was getting upon this "scaffold," the front portion of one of the steps broke, causing the man to fall. His injuries necessitated his keeping from work for seven weeks. Shortly after the accident—continued Mr. Gibson—an agent from the company with which the respondent appeared to be insured called upon the applicant, asking him to accept 20*s.* in settlement of his claim. The applicant refused; but probably his Honour would say that by making the offer the other side admitted their liability.

The applicant bore out his solicitor's opening statement.

In cross-examination, applicant said that the two pairs of steps were not leaning against opposite walls of the room, but were opened and standing a little distance away from the walls. All that was being done to the house was the washing off and papering of the walls, and the whitewashing of the ceilings of some of the rooms. Counsel for the respondent submitted that the evidence did not go to show that the building was being "repaired," within the meaning of the Act; and also, that it had not been shown that the building was being repaired by means of a "scaffold," within the meaning of the Act. Recent decisions concerning such points in the Workmen's Compensation Act, continued the learned counsel, had been extremely contradictory, but he submitted that, although it had been held that whitewashing of ceilings and washing or distempering of walls, with certain structural alterations of the building, came under the heading of "repairing," the whitewashing of ceilings and preparing of walls for papering alone would not be "repairing." The work must be of a more substantial character in order to be classed as "repairing," as intended by the Act. He did not go so far as to say that the man claiming compensation must necessarily have been engaged in the substantial work, but that the work being done on the building must be of a substantial nature. With regard to the question of the scaffold—it had been held, in the recent case of Wood *v.* Walsh, that two pairs of trestles with a board laid upon and between them was a "scaffold," within the meaning of the Act, although later cases went to show that this was a matter of law and fact combined. He submitted, however, that there was no case which went so far as to show that a couple of pairs of step-ladders with a board across them could be called a "scaffold." According to ordinary English usage of the word, such a small contrivance was not a scaffold, and he submitted that recent decisions went to support him in his contention. Trestles were often the basis of a scaffold, but step-ladders were quite different. A pair of steps was put to a wrong use, he submitted, when used with a view to forming a scaffold.

Mr. Joseph Welch, the respondent, and James Brown, who was assisting on the job in question, gave some evidence as to the position of the "scaffold," both before and after the accident.

The Judge said he thought that the applicant had been working upon a "scaffold," but the question then had to be considered as to whether the house was being "repaired," as mentioned in the Act. His Honour did not see why painting and whitewashing should not be included under the heading of "repairs," but there seemed to be a tendency in recent decisions to the effect that they should not be so included. It seemed that there must be something of a structural character involved in the work in order to bring it under the heading of "repairs." There was a distinction, although he thought it was a very narrow one. If it had not been for some recent decisions, he thought he would have been inclined to find for the applicant; but in the light of such decisions, he did not think that the present case was one in which the building was under "repair," within the meaning of the Act. Therefore he must find for the respondent.

His Honour also allowed costs.

IMPORTANT CASE UNDER THE LANDS CLAUSES ACT, 1845.

THE case of the Long Eaton Recreation Grounds Co., Ltd., *v.* the Midland Railway Co., came before the Court of Appeal composed of the Master of the Rolls and Lords Justices Mathew and Cozens-Hardy on the 14th and 15th insts., on the appeal of defendants from the judgment of Mr. Justice Lawrance sitting without a jury, at Derby, on August 12, 1901.

This was an action upon an award. The defendants are owners in fee simple of land situate on the north-west of Springfield-avenue, Long Eaton, in the county of Derby, which they purchased from grantees of the plaintiffs. The conveyances from the plaintiffs to these grantees contained covenants that they would not erect or permit to be erected any erection or building of any kind except a fence wall not more than 2 ft. high, with suitable iron palisades, nearer to Springfield-avenue than the line drawn on the plan annexed to their conveyance and marked "building line," and would not erect any buildings on the land conveyed other than private dwelling-houses with proper conveniences thereto fronting Springfield-avenue, of a certain value, and would not carry on upon the land conveyed any trade or business of a noisy or offensive character. The defendants, when they purchased the land in question from these grantees of the plaintiffs, took with notice of these restrictive covenants, and they constructed a railway embankment with a permanent railway upon the land. It was admitted that the embankment encroached beyond the building line. Instead of a 2-ft. fence wall, defendants erected a post and rail fence nearer Springfield-avenue than the building line, and ran trains along the railway.

Mr. Justice Lawrance was of opinion that each of these specified acts, if done by a private purchaser of the plaintiffs' land, would have been a breach of the restrictive covenant, for which such a purchaser would be liable to be restrained by injunction. On behalf of the defendants, it was contended that a railway embankment was not a "building" within the meaning of the covenant, but his Lordship held that a railway embankment alone—namely, without its possible appurtenances, such as signal-boxes, &c.—was a building within the meaning of the covenant, the object of which was to maintain a uniform range of buildings. The question in the case was whether the land of the plaintiffs had been "injuriously affected" by the execution of the defendants' works within Section 68 of the Lands Clauses Act, 1845. His Lordship held that there had been a physical interference by the defendants with the right of the plaintiffs to have no buildings other than those of a certain size and description, as specified in the covenant, erected on land which the defendants had taken; that there had been a similar interference with the plaintiffs' right to have the building line regarded, and the brick wall built as provided, if built at all, and that there had also been an interference with their right by express covenant that this land should not be used for any business of a noisy character. For what the defendants had done his Lordship thought the plaintiffs were entitled to compensation, and gave judgment for them for 650*l.*—the amount of the award with interest. Hence the present appeal of the defendants.

Mr. Baggalay, K.C., Mr. W. J. Noble, and Mr. C. H. Sargant, appeared for the appellants, and Mr. Hugo Young, K.C., and Mr. W. H. Stevenson for the respondents.

At the conclusion of the arguments of counsel, their Lordships held that as a restriction had been put on the user of the land for the benefit of the neighbouring land, the withdrawal of that benefit was subject matter of compensation. The judgment of Mr. Justice Lawrance was affirmed, and the appeal dismissed with costs.

CORRECTION.—In our last issue, on page 41, in our report of the Fleet-street Ancient Light Dispute (Cooling *v.* Rust) the name "Mr. Edgar Ross" occurs. It should have been David A. Ross.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

5,308.—A COMBINED WIND-VANE AND ANEMOMETER: *J. Baxendell and F. L. Halliwell.*—The pressure in a tube which a vane keeps opposed to the wind is conveyed down another tube to the velocity-recording apparatus, whilst a long rod that turns with the vane works the direction-recording apparatus. The force of the wind upon a plate that moves against a spring indicates the amount of pressure upon a dial which also serves as a vane. The plate is secured to rods that can freely slide lengthwise and are joined with a cross-bar to the spring. The plate is locked so as to prevent it from moving back by means of the action of a perforated hinge upon a rod which is joined to the cross-bar. A pull upon a rope that acts through crank-levers will release the clutch. The maximum pressure is registered by an indicator worked with a rack and pinion, and a dash-pot and piston restrain the action.

5,311.—A CIRCULAR-SAW GUARD: *M. Mindelsohn (Birmingham Cabinet Manufacturing Co.).*—At the back of the saw-bench is a pedestal which carries a horizontal arm, on the end whereof a boss is secured with a set-screw. On the boss is a lug, which is bolted on to a pivoted arm that is stopped from falling below a horizontal position. A bolt and slot join the front guard to the outer end of the arm, and a backward projection from the boss carries the riving-knife, which has a corrugated section.

5,313.—A GUIDE FOR BAND-SAWS: *T. Lees, R. Lees, and W. Lees.*—Two pulleys, mounted above and below the saw-bench, respectively, support the back of the saw. The flat side of the saw is caused to press against the cylindrical surface of a boss. A larger disc, having a detachable facing of steel, supports the back of the saw. The spindle of the upper pulley can be fixed adjustably in a cross-slot with a screw. The back of the saw is prevented from cutting grooves in the steel facing by means of the turning of the pulleys.

5,319.—PULLEYS FOR WINDOW SASHES: *A. V. Campbell.*—Through the window frame is inserted a spindle which is slotted at its one end and screwed at the other and carries one loosely-mounted pulley or more; the mortises for the pulleys can be provided with linings.

5,336.—A MATERIAL FOR INSULATING AND OTHER PURPOSES.—*J. Stocker & H. Zander.*—The compound is made of caustic potash dissolved in water with the addition of borax and a solution of finely pulverised soap-stone, and the paste is kept during some while in a vessel hermetically closed; when the superfluous liquid has been drained away there are added calcined or feather alum, calcined magnesia, chloride of calcium and Brazilian wax or some such similar ingredient; the material is described as being available for making tubes, plates, and bars, imitation marble, slate and granite, and other goods for covering roofs and walls.

5,340.—PROCESS OF CALCINING CEMENT: *B. B. Lathbury and H. S. Spackman.*—Powdered fuel is injected for the heating of rotatory kilns. An elevator raises the cement clinker, after its discharge at the lower end of the kiln, into a hopper, whence a distributor feeds it into a receiver cooled with air, the hot air being conveyed by a trunk to a fan for setting up the blast that feeds the fuel. The distributor comprises a doubly-tumbling bucket, by which the material is alternately tipped from two quadrantal compartments, and which also prevents heated air from leaving the cooler. A screw conveyor feeds the ground fuel into a hopper, the stream of fuel being turned with a diaphragm over the mouth of a nozzle whence flows the hot air blast.

5,348.—A FIRE-ALARM: *W. S. Lewis.*—The inventor contrives that the escape of compressed air occasioned by fire shall close an electrical bell circuit. The weight of a rod compresses the air in a bellows which is joined to a fusible and closed pipe that is passed through the rooms of a building, so that, in the event of a fire, air will escape from the bellows. The descent of the rod closes circuit, and the alarm is sounded. A bell-crank lever with a flag to be turned outwards by the rod as it falls serves to indicate a leakage of air.

5,373.—SIPHONICAL DISCHARGE: *M. J. Adams.*—At the end of the shorter leg of the siphon, and made in one piece with it, is placed a vertical cylinder provided with an inlet flap-valve and a heavy piston that moves above the valve. When the piston has been raised and then allowed to descend by means of the pull-chain, it will impel water over the crown of the siphon and so start the flush.

5,374.—AN ANTI-FOULING AND ANTI-CORROSION COMPOSITION: *W. Briggs.*—A compound is made of pitch or bitumen, whiting or lime, flake mica, and fine sand or Portland cement, melted together, and applied when hot to the surface after the latter has been cleaned and coated with paint or some bituminous solution.

5,433.—TRUCKS FOR THE CONVEYANCE OF BRICKS: *R. Lindemann.*—For lifting the load in parts is contrived a frame, in which slide two or more carriers having supporting arms. As an arm on a shaft is pulled towards the right side, a cam moves a lever to pull a chain, and so to cause another lever to raise the upper carrier; then other cams press against levers for lifting the rollers that run loosely upon a cross-shaft in another carrier. After the carriers have been quite lifted up, the tendency of lever-mounted rollers to run off the surfaces of the cams is frustrated by the end of the arm upon the shaft as it bears against the edge of the truck. The frame can be disposed horizontal-wise on occasion by means of the bearings that carry the shaft of the frame.

5,450.—CONSTRUCTION OF FLOORS AND CEILINGS: *F. Cancalon.*—Squared, inclined, or interlocking edges are fashioned upon hollow or solid blocks of terra-cotta or other substance, which are hung from the beams or joists by means of the recessed or bevelled blocks resting upon the flanges or ribs of the joists. The edges or top faces of the terra-cotta blocks are grooved to take the squared or dovetailed side ribs of the recessed blocks. Packing material is then filled in the grooves. In one mode cement cast *in situ* along the joists is employed for securing ceiling-blocks to the joists.

5,466.—JOINTING FOR PIPES, &C.: *J. H. Heaword and G. L. Hulme (J. Hulworth & Co.).*—The spreading or bursting of rubber and similar packing-rings is obviated by means of a light metallic ring laid around or embedded in the ordinary packing-ring, and made up of wire loops soldered or otherwise fastened to one another. An extension loop or rod, made with or fixed on to the wires, will hold the packing-ring in its place as the joint is being made.

5,475.—GUTTERS AND TROUGHS: *A. D. Pogson.*—A gutter or trough available for footpaths, stables, yards, slaughter-houses, and so on, is provided in the shape of a semi-circular box which is closed at one end and has a detachable lid to be set on the level of the surface: the sections of the lid repose upon ledges of the gutter lengthwise, their projections engage with the undersides of the adjacent sections and with studs or snugs upon the gutter, and they are locked down with a screw-down pin or with a shooting bolt.

5,509.—CONSTRUCTION OF DRYING KILNS: *R. Axer.*—The inventor seeks to obviate the corrosion of the iron trucks that convey goods through kilns of which the drying chambers consist of tunnels. He causes the exhaust gases charged with steam to be returned in part to the flues that they may there be mingled with the furnace gases before the latter enter the drying chamber, and provides hinged dampers for the charge and discharge doors for the

escape of the gases through the opened doors so as to prevent a flow of air into the chambers. The tunnels are disposed side by side, the gases of combustion from the furnaces at either side flow into cross-flues above and below the tunnels, and the openings of communication towards the middle of the kiln have increasing areas, where they mingle with a part of the exhaust gases as the latter are drawn off with a fan.

5,515.—EXTINCTION OF FIRE IN PETROLEUM AND OTHER TANKS: *F. Shuman.*—Over the surface of the stored liquid is hung a weight at the end of a fusible wire. A layer of a solution of some carbonate is deposited at the bottom of the tank. Above that layer is set a subsidiary and small tank, having thin sides and charged with sulphuric or other acid. In the event of fire, the wire melts, the weight falls on to and breaks through the inner tank, whereupon the acid mixes with the solution, and the resultant carbonic-acid gas ascends to extinguish the fire. In another adaptation an explosive cartridge is substituted for the weight. The bullet pierces the little tank and the explosion sounds an alarm.

5,565.—CANS FOR WORKMEN: *G. Hunter.*—At the lower end of the can is a spirit-lamp, which may be made in one piece with the can, or be detachable. A suitable door and ventilating openings are fitted to the lamp.

5,617.—SPIGOT-AND-SOCKET JOINTS FOR PIPES: *P. O. Fell.*—A joint available for pipes of metal, concrete, stoneware, earthenware, and ironstone consists of a spigot having a projecting lug that fits into the doubly-socketed end of the pipe. The tapered socket flange makes a key for the jointing material, which a gasket of clay or a tar band excludes from the joint. The socket has an orifice for the escape of air.

5,681.—A LIFTING-JACK: *E. Deville.*—Upon the standard is affixed a nut for engagement with a screw mounted on the head of an outside sleeve which is turned with a pawl and a ratchet-wheel; in variant forms of the invention the nut is set in a movable sleeve, the screw being fixed, or the driving worm gear is adjusted upon an outer parallel shaft which is disposed so as to gear with the lifting screw, or the worm is set in direct engagement with a worm-wheel upon the screw.

5,748.—SHEET-METAL OPEN-WORK FOR LATHING: *Universal Metal Lath and Patent Co.*—Lathing for ceilings, floors, walls, fireproof buildings, screens, and so on, is fashioned in various shapes from metallic blanks; in one shape a slitted blank produces a zig-zag lathing sheet of open work by firmly holding down the alternate blank spaces upon a bench whilst intermediate strips are forced backwards and upwards in order to open the slits between the slats; V-shaped distance-strips for sustaining metallic lathing away from a wall or other surface have their slats inclined in opposed directions in order that they shall resist pressure at the angle; an expanded sheet can be affixed to a wall by means of inclined or indented portions made at intervals along its length.

5,756.—INSPECTION-OPENINGS FOR MANHOLES: *C. E. Price.*—The branches are arranged so as to discharge always into the main channel in the same direction as that of the main flow, the discharge being turned into open channels formed in the iron bottom of the chamber.

5,758.—IMPROVEMENTS IN PUG-MILLS: *A. Diss.*—For separation of the stones and the division or mixing of the brick-making material the inventor provides a grating for the aperture of the pug-mill, eyes or studs fashioned upon the grating engage with pins or eyes that extend from brackets which are bolted on to the cylinder of the pug-mill, and the bars of the grating have wedge-shaped cutting edges.

5,759.—CONSTRUCTION OF WALLS: *A. Diss.*—For laying damp-courses of cement or asphalt on walls is devised a frame made up with cross and side bars which are to be joined together with screws and fly-nuts, and are slotted for their adjustment. The cross-bars will slide in guiding-blocks of the side-bars, one of which is rebated or has guiding-lugs that will press against the wall surface.

5,806. — IMPROVEMENTS IN LEVELS, CLINOMETERS, SURVEYING INSTRUMENTS, &c.: *Sir H. Grubb.*—The transparent card, with an annular scale, of a prismatical compass is carried upon a pivot underneath a sighting-tube having apertures through which the object is sighted directly. For virtually projecting the graduations of the card, as clear or white lines upon a darkened ground, upon the object is devised an optical system, thus: a reflecting prism illuminates a fiducial and sighting line, a compound reflecting and converging prism is mounted above and with a lens parallelises the light from the sighting-line and the compass scale opposite it, a reflecting prism and a plate receive the parallel rays in succession whence they enter the eye collinearly with rays from the object, whereby parallax is obviated. For a graphometer the sighting system, being after either the refracting or the reflecting kind, is carried by a radius bar on which are needles that will prick off the direction when it has been determined. For a level the sight is mounted in a vertical tube, and in the sighting-tube is a reflecting-plate beneath the collimating lens at the base of the vertical tube; the level can be seen by reflection in the plate by means of an aperture formed in the top of the sighting-tube immediately below the middle of the level, or the level is put in front of the sight. A combined contrivance for alternative use as an optical square or a range-finder has a prism so mounted as to turn about the axis of the sighting-tube. When turned through 180 deg. from the position for acting as an optical square, it can be employed, together with a sighting-scale, for ascertaining the range by means of the projection of the scale upon an object whereof the dimensions are known. For a circumferentor the card of a compass-box is observed by a mirror, the sighting-tube being mounted above the box, whilst to its top is affixed another box carrying a fixed tube, inside which is a rotatable tube on which a prism is mounted. A graduated disc on the box carries a tube, at the top of which is fitted a prism: to that disc toothed gearing joins the rotatable tube, which will then turn through half the angle. An inversion of the arrangement will render it available as a prismatical compass. The specification extends to optical squares and to clinometers. Confer also No. 4,420 of 1901.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

July 1.—By R. L. ASHTON (at Bideford).

Bradworthy, Devon.—Great Dinworthy Farm, 270 acres, *f.*	£3,500

By W. J. VILLAR & Co. (at Dulverton).

West Anstey, Devon,—Guphill Farm, 204 a., 1 r. 26 p., *f.*	1,600

July 3.—By SALTER, SIMPSON & SONS (at Norwich).

Great Snoring, Norfolk.—Wine Park Farm, 213 a. 2 r. 36 p., *f.*	3,100
Banham, Norfolk.—Freehold Farmhouse and 190 a. 0 r. 30 p.	2,100

By MADDISON, MILES & MADDISON (at Norwich).

Stokesby, Norfolk.—The Cottage Farm, 244 a. 3 r. 17 p., *f.*	5,200
The Whitegate Farm, 167 a. 0 r. 12 p., *f.*	4,700
A freehold cottage, *w.r.* 7*l.*	110
Freehold grazing marshes, 105 a. 1 r. 30 p.	3,720
The Marshman's Occupation, with drainage mill, 29 a. 0 r. 35 p., *f.*	800
A freehold house and 3 a. 3 r. 24 p.	400
Enclosures of land, 13 a. 1 r. 11 p., *f.*	490
Five freehold cottages and 2 a. 0 r. 34 p.	430

By SEXTON & GRIMWADE (at Colchester).

Boxted, Essex.—Holly Tree Farm, 102 a., *f.*, *y.r.* 90*l.*	415
West Bergholt, Essex.—King's Farm, 24 a. 2 r. 6 p., c., p.	360

July 7.—By FRANK NEWMAN.

Mayfair.—27, Davies-st. (S), a profit rental of 80*l.* for 15½ yrs., with reversion for 4 yrs.	1,210

By P. W. TALBOT & Co.

Tottenham Court-rd.—23, Warren-st. (S), *f.*, *e.r.* 54*l.*	960
Marylebone.—37, New-st.-mews (workshop and stabling), u.t. 18½ yrs., *g.r.* 12*l.* 10*s.*, *y.r.* 53*l.*	300
Haverstock Hill.—12, Maitland Park-vil., u.t. 45½ yrs., *g.r.* 10*l.* 10*s.*, *y.r.* 31*l.*	455

By SALTER, SIMPSON, & SONS (at Swaffham).

Sporle, &c., Norfolk.—Freehold farmhouse and 77 a. 2 r. 16 p.	1,150
Great Dunham, &c., Norfolk.—Echo Farm, 82 a. 3 r. 32 p., *f.*	1,600

By RICHARD AUSTIN & SON (on the Estate).

Droxford, Hants.—Freehold building land, 21 a.	2,010
Enclosures of land, 114½ a., *f.*	2,325

July 8.—By FIELD & SONS.

Hoxton.—Hyde-rd., The Barley Mow p.-h., &c., l.g.r. 16*l.* 12*s.*, u.t. 17 yrs., *g.r.* 21*l.* 13*s.*	300
Romford, Essex.—27 to 35 (odd), London-rd. (S), *f.*, *y.r.* 127*l.* 6*s.*	1,110
41, 43, and 45, London-rd. (S), *f.*, *y.r.* 78*l.*	845
Chadwell Heath, Essex.—1 to 4, White Hart Cottages, *f.*, *w.r.* 57*l.* 4*s.*	870

By HAMPTON & SONS.

Wimbledon.—Cambridge-rd., Hollymount, and 2 a., *f.*, p.	3,000

By REYNOLDS & EASON.

Bermondsey.—49, Abbey-st. (S), *f.*, *y.r.* 45*l.*	875
Bromley-by-Bow.—27 and 29, Swaton-rd., u.t. 60 yrs., *g.r.* 8*l.* *w.r.* 54*l.* 12*s.*	520

By ROGERS, CHAPMAN, & THOMAS.

Limehouse.—32, East India Dock-rd., *f.*, *q.r.* 40*s.*	700

By DEBENHAM, TEWSON, & Co. (at Newcastle).

Whitley Bay, Northumberland.—The Promenade, a freehold building estate, 5 a. 2 r. 32 p.	7,300

By HUMBERT & FLINT (at Watford).

Watford, Herts.—285 and 287, High-st., *f.*, *y.r.* 42*l.*	600
290 and 292, High-st., *f.*, *w.r.* 31*l.* 4*s.*	400
19 to 24, Albert-st., *f.*, *w.r.* 83*l.* 4*s.*	940
12 to 15, Red Lion-yard, *f.*, *w.r.* 34*l.* 9*s.*	165
76 and 78, Estcourt-rd., *f.*, *w.r.* 32*l.* 10*s.*	375
48 to 54 (even), Leavesden-rd., *f.*, *w.r.* 62*l.* 8*s.*	700
Bushey, Herts.—71 to 77 (odd), Villiers-rd., *f.*, *w.r.* 54*l.* 12*s.*	640
12, 14, and 16, High-st., *f.*, *w.r.* 27*l.* 14*s.*	300

July 9.—By RUSHWORTH & STEVENS.

Chelsea.—66, Sydney-st., *f.*, *y.r.* 66*l.*	1,200
Sydney-st., *f.* *g.r.* 6*l.*, reversion in 25 yrs.	440
2, 4, 6, and 8, Guthrie-st., u.t. 63¼ yrs., *g.r.* 26*l.*, *y.r.* 180*l.*	1,605
1, 3, 5, and 7, Guthrie-st., u.t. 63¼ yrs., *g.r.* 26*l.*, *y.r.* 194*l.*	1,165
10, Glebe-pl., u.t. 63½ yrs., *g.r.* 7*l.*, *y.r.* 56*l.*	710

By GREEN & SON (Hammersmith).

Hammersmith.—90, 92, and 94, Bridge-rd., area 1,760 ft., c., p.	1,480
76, Claybrook-rd., u.t. 64 yrs., *g.r.* 5*l.*, *w.r.* 36*l.* 8*s.*	360
Chiswick.—7, Dale-st., u.t. 66 yrs., *g.r.* 2*l.* 10*s.*, *w.r.* 32*l.* 10*s.*	360

By HIGGINS & SON.

Hampstead.—123, Belsize-rd., u.t. 52½ yrs., *g.r.* 10*l.* 10*s.*, *y.r.* 55*l.*	570

By HUNTER & HUNTER.

Hyde Park.—Hyde Park-ter., 1 *g.r.* 45*l.*, u.t. 20 yrs., *g.r.* 40*l.* 4*s.*, with reversion	360
Fulham.—79 to 85 (odd), Bayonne-rd., *f.*, *w.r.* 120*l.*	1,450

By MESSRS. LEAGE.

Dalston.—92 and 94, Gayhurst-rd., u.t. 46½ yrs., *g.r.* 10*l.*, *y.r.* 36*l.*	710
Kingsland-rd.—39 and 41, Clarissa-st., u.t. 16½ yrs., *g.r.* 6*l.*, *w.r.* 65*l.*	220

By W. SALISBURY & HAMER (at Hurst Green).

Aighton, Lancs.—Foxfield's Farm, 77 a. 0 r. 13 p., *f.*	3,600
Shawrigg's Farm, 149 acres, *f.*	5,300

July 10.—By H. J. BLISS & SONS.

Hackney-rd.—39, 41 and 43, Brunswick-st. and 36, Dunloe-st., with workshop and timber yd., *f.*, *y.r.* 282*l.* 12*s.*	2,950
1, 2, 5 to 11 and 15, Seabright-gdns. and 1 to 5, Steel's-buildings, also two ranges of workshops, u.t. 12 yrs., *g.r.* 30*l.*, *w.r.* 383*l.* 10*s.*	910
Tottenham.—10, Elizabeth-rd., u.t. 76 yrs., *g.r.* 5*l.*, *w.r.* 33*l.* 16*s.*	180

By BOYCE, EVENS, & CARPENTER.

Hoxton.—5, 6, 7, and 7½, Royal Oak-walk, *f.*, *w.r.* 58*l.* 10*s.*	600
Wapping.—4 and 5, Dundee-st., u.t. 204 yrs., *g.r.* 1*l.*, *e.r.* 50*l.*	235

By DEBENHAM, TEWSON, & Co.

Bow.—Avenue-rd., Avenue Cottage, u.t. 29 yrs., *g.r.* 5*l.* 10*s.*, p.	475

By FAREBROTHER, ELLIS, & Co.

Brockley.—1 and 2, Zetland-villas, *f.*, *y.r.* 72*l.*	580

By GLASIER & SONS.

Maidenhead, Berks.—Ray Park-av., Kenwick Lodge and 1¼ a., *f.*, *y.r.* 100*l.*	1,600
Camberwell.—38, 40, 42, and 44, Shenley-rd., u.t. 64 yrs., *g.r.* 27*l.*, *y.r.* 143*l.*	1,400

By C. C. & T. MOORE.

Clapton.—199, Lower Clapton-rd. (S), *f.*, *y.r.* 100*l.*	2,530
111 and 113, Downs-rd. (S), *f.*, *y.r.* 110*l.*	2,200

By NEWSON, EDWARDS, & SHEPHARD.

Caledonian-rd.—4 and 6, Bryan-st., u.t. 41½ yrs., *g.r.* 8*l.*, *q.r.* 58*l.*	450
7 and 9, Bryan-st., u.t. 39½ yrs., *g.r.* 10*s.*, *y.r.* 106*l.*	900
16 and 17, Bryan-pl., u.t. 41½ yrs., *g.r.* 4*l.*, *y.r.* 48*l.*	470
Hoxton.—63, Gopsall-st., u.t. 34 yrs., *g.r.* 5*l.*, *y.r.* 36*l.*	280
Islington.—47, Ecclesbourne-rd., u.t. 40 yrs., *g.r.* nil, *y.r.* 40*l.*	440
64, Halliford-st. (S), u.t. 40 yrs., *g.r.* nil, *y.r.* 36*l.*	390
Barnsbury.—77, Richmond-rd., u.t. 44½ yrs., *g.r.* 4*l.*, *y.r.* 53*l.*	600
Walthamstow.—137, High-st. (S), *f.*, *y.r.* 40*l.*	720
Southall.—Osterley Park-rd., *f.g.r.* 12*l.* 12*s.*, reversion in 96 yrs.	330
Holloway.—101 and 103, Seven Sisters-rd., *f.*, *y.r.* 102*l.*	2,110
Woolwich.—Hill-st., the Wellesley Hotel, u.t. 21½ yrs., *g.r.* 10*l.*, *y.r.* 100*l.*	1,130

By STIMSON & SONS.

Old Kent-road.—No. 720a (S), u.t. 88½ yrs., *g.r.* 7*l.*, *y.r.* 62*l.*	530
92 and 102, Trafalgar-rd., u.t. 43½ yrs., *g.r.* 20*l.*, *y.r.* 90*l.*	740
Tooting.—15, 17, and 21, Trinity-rd. (S), *f.*, *y.r.* 122*l.* 10*s.*	1,550
Trinity-rd., *f.g.r.* 40*l.*, reversion in 94 yrs.	1,000
Islington.—37, Northampton-st., u.t. 16 yrs., *g.r.* 4*l.*, *e.r.* 35*l.*	180
Kensington.—3, Edith-rd., u.t. 67 yrs., *g.r.* 6*l.*, *y.r.* 60*l.*	550
Tottenham.—4, 6, and 8, Summerhill-rd., *f.*, *y.r.* 76*l.*	910
Leyton.—Melbourne-ter., *f.g.r.* 's 20*l.*, reversion in 82½ yrs.	420
Rayleigh, Essex.—Crown-lane, freehold building land, 1 a., 1 r. 37 p.	550
High-st., Bramshot House, *f.*, *q.r.* 38*l.*	500
Eastwood-rd., a freehold cottage, *y.r.* 8*l.*	360
Love-lane, freehold pasture land, 2 a. 1 r. 7 p.	275

July 11.—By C. RAWLEY CROSS & Co.

Sutton, Surrey.—Eaton-rd., Innisfallen, *f.*, *y.r.* 80*l.*	1,400
1 to 5, Cumnor-rd., *f.*, *y.r.* 171*l.*	2,550

By DUNCAN & KIMPTON.

Great Canfield, Essex.—Ashfield's Farm, 207 a. 2 r. 24 p., *f.*, *y.r.* 110*l.*	3,580
Dalston.—7 and 9, Bentley-rd., u.t. 16½ yrs., *g.r.* nil, *e.r.* 32*l.*	205

By GRAVES & SON.

Islington.—6 to 15, James-st., u.t. 7½ yrs., *g.r.* nil, *w.r.* 377*l.*	875
15, Rydon-st., u.t. 25 yrs., *g.r.* 5*l.* 5*s.*, *y.r.* 40*l.*	850
37 and 39, Ecclesbourne-rd., u.t. 37 yrs., *g.r.* 14*l.*, *y.r.* 76*l.*	590
66 and 68, Rotherfield-rd., u.t. 39 yrs., *g.r.* 12*l.*, *y.r.* 78*l.*	560

By W. F. HALLETT.

Holloway.—Dunford-rd., l.g.r's. 18*l.*, u.t. 61½ yrs., g.r. 6*l.* 224
Lowman-rd., l.g.r's. 18*l.*, u.t. 63 yrs., g.r. 6*l.* .. 216
1, Dunford-rd., with stabling, workshop, &c., u.t. 61½ yrs., g.r. 8*l.*, y.r. 63*l.* 700
Kentish Town.—62, Fortess-rd., u.t. 21 yrs., g.r. 10*l.* 10s., o.r. 50*l.* 150

By WOODS & SNELLING.

Sidcup, Kent.—Church-av., Wrens, f., e.r. 55*l.* .. 970

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; w.r. for weekly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard.

MEETINGS.

SATURDAY, JULY 19

Devon and Exeter Architectural Society.—Excursion to Truro on the invitation of Mr. Silvanus Trevail, F.R.I.B.A.

SATURDAY, JULY 26.

Architectural Association.—Fourth summer visit, to view church and monastery of St. Francis, Bocking Bridge, Essex, by the late Mr. J. F. Bentley.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks	1 13 0	per 1,000 alongside, in river	
Rough Stocks and Grizzles.....	1 10 0	,,	,,
Facing Stocks	2 12 0	,,	,,
Shippers	2 7 0	,,	,,
Flettons.....	1 8 0	,,	at railway depôt.
Red Wire Cuts ..	1 12 0	,,	,,
Best Fareham Red	3 12 0	,,	,,
Best Red Pressed Ruabon Facing.	5 5 0	,,	,,
Best Blue Pressed Staffordshire ..	4 6 6	,,	,,
Do., Bullnose	4 11 0	,,	,,
Best Stourbridge Fire Bricks	4 6 0	,,	,,
GLAZED BRICKS			
Best White and Ivory Glazed Stretchers.....	13 0 0	,,	,,
Headers	19 0 0	,,	,,
Quoins, Bullnose, and Flats	17 0 0	,,	,,
Double Stretchers	19 0 0	,,	,,
Double Headers..	16 0 0	,,	,,
One Side and two Ends	19 0 0	,,	,,
Two Sides and one End	20 0 0	,,	,,
Splays, Chamfered, Squints.....	20 0 0	,,	,,
Best Dipped Salt Glazed Stretchers and Headers ..	19 0 0	,,	,,
Quoins, Bullnose, and Flats	14 0 0	,,	,,
Double Stretchers	15 0 0	,,	,,
Double Headers..	14 0 0	,,	,,
One Side and two Ends	15 0 0	,,	,,
Two Sides and one End	15 0 0	,,	,,
Splays, Chamfered, Squints.....	14 0 0	,,	,,
Seconds Quality White and Dipped Salt Glazed....	9 0 0	,,	less than best.
Thames and Pit Sand	7 3	per yard, delivered.	
Thames Ballast	6 0	,,	,,
Best Portland Cement	31 0	per ton, delivered.	
Best Ground Blue Lias Lime..	25 0	,,	,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime..... 10s. 6d. per yard, delivered.
Stourbridge Fire-clay in sacks, 26s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depot
Bath ,, ...	1 7	,, ,,
Farleigh Down Bath ..	1 8	,, ,,
Beer in blocks	1 6	,, ,,
Grinshill ,, ...	1 10	,, ,,
Brown Portland in blocks	2 2	,, ,,
Darley Dale in blocks..	2 4	,, ,,
Red Corsehill ,,	2 5	,, ,,
Closeburn Red Freestone	2 3	,, ,,
Red Mansfield ,,	2 4	,, ,,
Hard York in blocks ..	2 10	,, ,,
,, ,, 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super. at rly. depôt.
,, ,, 6 in. Rubbed Ditto..	3 0	,, ,,
,, 3 in. sawn both sides slabs (random sizes)	1 3	,, ,,
,, ,, 2 in. self-faced Ditto	0 9½	,, ,,
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube. deld. rly. depôt
,, ,, ,, 6 in. sawn both sides landings	2 7	per ft. super. deld. rly. depôt.
,, ,, ,, 3 in. do.	1 2½	,, ,,

PRICES CURRENT (*Continued*).

SLATES.

in. in.	£ s. d.	
20 × 10 best blue Bangor..	12 0 0	per 1000 of 1200 at ry. dep
,, best seconds ,,	11 10 0	,, ,,
16 × 8 best ,,	6 17 6	,, ,,
20 × 10 best blue Portmadoc	11 7 6	,, ,,
16 × 8 best blue Portmadoc	6 5 0	,, ,,
20 × 10 best Eureka unfading green....	13 10 0	,, ,,
16 × 8 ,, ,,	7 10 0	,, ,,
20 × 10 permanent green	10 10 0	,, ,,
16 × 8 ,, ,,	6 0 0	,, ,,

TILES.

	s. d.		
Best plain red roofing tiles..	41 6	per 1,000, at rly. depôt.	
Hip and valley tiles....	3 7	per doz.	,, ,,
Best Broseley tiles	45 6	per 1,000	,, ,,
Hip and valley tiles....	4 0	per doz.	,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000	,, ,,
Do. ornamental Do.	60 0	,,	,, ,,
Hip tiles	4 0	per doz.	,, ,,
Valley tiles	3	,,	,, ,,
Best Red or Mottled Staffordshire Do. (Peakes) .	50 9	per 1,000	,, ,,
Hip tiles	4 1	per doz.	,, ,,
Valley tiles.....	3 8	,,	,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.....	14 10 0	16 0 0
Deals: best 3 by 9.....	13 10 0	15 0 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.....	10 10 0	11 10 0
Battens: best 2½ by 6 and 3 by 6 ..	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,, ,,
2 in. by 4 in. and 2 in. by 6 in. ..	8 10 0	9 10 0
2 in. by 4½ in. and 2 in by 5 in. ..	8 0 0	9 0 0
Foreign Sawn Boards—		
1 in. by 12 in. by 11 in.	0 10 0	more than battens.
½ in.	1 0 0	,,
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks.....	2 15 0	3 0 0
Itch-pine timber (30 ft.).....	3 0 0	3 10 0

JOINERS' WOOD.

	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
3 in. by 9 in.	20 0 0	21 0 0
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	18 0 0
Second yellow deals, 3 in. by 11 in.	18 0 0	20 0 0
,, ,, 3 in. by 9 in.	16 10 0	18 10 0
Battens, 2½ in. and 3 in. by 7 in.	13 0 0	14 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	14 0 0	15 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	20 0 0	21 0 0
Do. 3 in. by 9 in.	17 0 0	18 0 0
Battens.....	13 0 0	14 0 0
Second yellow deals, 3 in. by 11 in.....	15 0 0	16 10 0
Do. 3 in. by 9 in.	13 10 0	14 10 0
Battens.....	11 0 0	12 0 0
Third yellow deals, 3 in. by 11 in.....	12 10 0	13 10 0
Do. 3 in. by 9 in.	12 0 0	13 0 0
Battens.....	10 0 0	11 0 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	14 0 0	15 0 0
,, ,, ,, 3 in. by 9 in.	13 0 0	14 0 0
Battens	11 0 0	12 0 0
Second white deals 3 in. by 11 in.	13 0 0	14 0 0
,, ,, ,, 3 in. by 9 in.	12 0 0	13 0 0
,, ,, ,, battens.....	9 10 0	10 10 0
Pitch-pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 1	0 0 0
Yellow Pine—First, regular sizes..	32 0 0	33 10 0
Broads (12 in. and up).....	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube..	0 3 6	0 4 6
Danzig and Stettin Oak Logs—		
Large, per ft. cube	0 0 6	0 3 0
Small ,, ,, ...	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube ..	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7½	0 0 8
½ in. do. do.	0 0 7	- - -
Dry Mahogany—		
Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks—		
Per ft. cube.....	0 3 0	0 3 6
Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0
1 in. by 7 in. white, planed and shot	0 11 0	0 12 6
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6

6 in. at 6d. per square less than 7 in.

PRICES CURRENT (*Continued*).

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0	7 5 0
Compound Girders ,, ,,	8 2 6	9 5 0
Angles, Tees and Channels, ordinary sections	7 17 6	8 17 6
Flitch Plates	8 5 0	8 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 2 6	8 5 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Common Bars.....	7 15 0	8 5 0
Staffordshire Crown Bars, good merchant quality	8 5 0	8 15 0
Staffordshire "Marked Bars" ..	10 10 0	- - -
Mild Steel Bars.....	9 0 0	9 10
Hoop Iron, basis price.....	9 5 0	9 10
,, ,, galvanised.....	16 0 0	- -
(* And upwards, according to size and gauge.		
Sheet Iron, Black,—		
Ordinary sizes to 20 g.....	10 0 0	- - -
,, ,, to 24 g.....	11 0 0	- - -
,, ,, to 26 g.....	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.....	12 15 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.....	14 5 0	- - -
Sheet Iron, Galvanised, flat, best quality:—		
Ordinary sizes to 20 g.....	16 0 0	- - -
,, ,, 22 g. and 24 g.	16 10 0	- - -
,, ,, 26 g.....	18 0 0	- - -
Galvanised Corrugated Sheets.—		
Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 15 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker ..	12 0 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in.	9 5 0	9 15 0
(Under 3 in. usual trade extras.)		

LEAD, &c.

	Per ton in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	13 17 6	- - -
Pipe in coils	14 7 6	- - -
Soil Pipe.....	16 17 6	- - -
ZINC—Sheet—		
Vieille Montagne..... ton	24 0 0	- - -
Silesian	23 15 0	- - -
COPPER—		
Strong Sheet..... per lb	0 0 10	- - -
Thin ..... ,,	0 0 11	- - -
Copper nails..... ,,	0 0 11	- - -
BRASS—		
Strong Sheet..... ,,	0 0 10	- - -
Thin ,, ... ,,	0 0 10½	- - -
TIN—English Ingots..... ,,	0 1 5	- - -
SOLDER—Plumbers' ..... ,,	0 0 7	- - -
Tinmen's ..... ,,	0 0 9	- - -
Blowpipe ..... ,,	0 0 10	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d.	per ft. delivered.
,, fourths	2¾d.	,, ,,
21 oz. thirds	3½d.	,, ,,
,, fourths.....	3¾d.	,, ,,
26 oz. thirds	4½d.	,, ,,
,, fourths	5¼d.	,, ,,
32 oz. thirds	5½d.	,, ,,
,, fourths	6¼d.	,, ,,
Fluted sheet, 15 oz.....	3d.	,, ,,
,, 21 ,, ...	4d.	,, ,,
½ Hartley's Rolled Plate	1¾d.	,, ,,
⅝ ,, ,, ,, ...	2¼d.	,, ,,
¾ ,, ,, ,, ...	2¾d.	,, ,,

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes or barrels ..	per gallon	0 2 9
,, ,, ,, in drums	,,	0 3 0
Boiled ,, ,, in pipes or barrels ..	,,	0 2 11
,, ,, ,, in drums	,,	0 3 2
Turpentine, in barrels	,,	0 2 10
,, in drums	,,	0 3 0
Genuine Ground English White Lead	per ton	21 0 0
Red Lead, Dry	,,	20 0 0
Best Linseed Oil Putty	per cwt.	0 2 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Elastic Copal Varnish for outside work ..	0 16 0
Best Elastic Copal Varnish for outside work ..	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work.....	0 10 0
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work.....	0 16 0
Best Hard Copal Varnish for inside work.....	1 0 0
Best Hard Carriage Varnish for inside work....	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 3 6
Berlin Black	0 16 0
Knotting.....	0 10 0
Best French and Brush Polish	0 10 0

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums	Designs to be delivered
*Municipal Offices and Public Library	Bideford Town Council	30*l.*, 15*l.*, and 10*l.*	Sep. 29

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
*Paving Materials, Tower Bridge	Corporation of London	Comptroller's Office, Guildhall	July 21
Additions to Chapel, Kingswear, Devon	.....	G. H. Mitchelmore, Waterhead, Kingswear	July 22
Church, Broughton Moor, Cumberland	.....	W. D. Caroe, Architect, 8, Whitehall-place, S.W.	do.
Villa, Camborne, Cornwall	.....	Kinsman, Moor, & Co., Camborne	do.
Road Works, Eaton-road	Dover Town Council	H. E. Stilgoe, Civil Engineer, Town Hall, Dover	do.
Street Paving Works, off Parson-street	Keighley Corporation	W. H. Hopkinson, Civil Engineer, Town Hall, Keighley	do.
Diverting part of Lillands-lane, Brighouse	L. & Y. Ry. Co.	R. C. Irwin, Hunt's Bank, Manchester	do.
Cast Iron Pipes (6,000 yards)	Swindon Corporation	Borough Surveyor, Town Hall, Swindon	do.
School, &c., Station-road, Hednesford	Cannock (Staffs) School Board	Bailey & McConnal, Architects, Walsall	do.
Lodge, &c., Hampden Park	Eastbourne Corporation	W. C. Field, Architect, Town Hall, Eastbourne	do.
Stabling, &c., Stowe-street depot	Lichfield Corporation	E. Brooke, surveyor, Frog-lane, Lichfield	do.
Cottage, Gas Works, Sheepscar	Leeds Corporation	R. H. Townsley, Gas Offices, Leeds	do.
Sewage Disposal Works	Lanchester R.D.C.	G. W. Westgarth, Surveyor, Lanchester	do.
Sewers, &c., Pentre, Glam	Rhondda U.D.C.	W. J. Jones, Engineer, Council Offices, Pentre	do.
Concrete Paving, Cambridge-street	Wellingborough U.D.C.	E. Sharman, Surveyor, Market-square, Wellingborough	do.
Road Works, Kynaston-road, &c	Croydon Town Council	Borough Road Surveyor, Town Hall, Croydon	do.
Eighteen Houses, Blackburn-street	Workington U.S.A.	J. Warwick, Town Hall, Workington	do.
*Tar Paving Materials, Plumstead	London County Council	Parks Department, 11, Regent-street, S.W.	do.
Additions, &c., to Cottage, Waterworks-road	Hastings Corporation	P. H. Palmer, Civil Engineer, Town Hall, Hastings	do.
Public Slaughter House, Bellahill, N.B.	District Committee	G. Paterson, Architect, Hamilton	do.
Bridge, Yalding	Kent County Council	F. W. Ruck, Surveyor, 86, Week-street, Maidstone	do.
Canal Wharf Wall, &c., Stuart-street	Manchester Corporation	City Surveyor, Town Hall, Manchester	do.
*Additions, &c., to School & Asphalting Playground, &c.	Bettws School Board	Clerk's House, Capel Bach, Llangonoyd, near Bridgend	do.
*Observation Block (Isolation Hospital)	Willesden District Council	Council's Engineer, Dyne-road, Kilburn, N.W.	do.
*Road Making and Paving Works	do.	do.	do.
*Granite Drinking Fountains, Hackney	London County Council	Parks Department, 11, Regent-street, S.W.	July 23
Drainage Works, Simon Langton, Canterbury	.....	J. Plummer, 38, St. Margaret's-street, Canterbury	do.
House and Shop, Town End, Golcar	.....	A. Shaw, Architect, Golcar	do.
Club Institute, Enfield-road, Leeds	.....	Buttery & Birds, Architects, Basinghall-square, Leeds	do.
Two Stables, South-street, Dewsbury	.....	J. Kirk & Sons, Architects, Huddersfield	do.
Battery Rooms, Buccleuch-street	Barrow-in-Furness Corporation	C. F. Preston, Town Hall, Barrow-in-Furness	do.
Altar, &c, Workhouse Chapel, Loughlinstown	Rathdown Guardians	P. F. Comber, Civil Engineer, 19, Lower Leeson-street, Dublin	do.
Storage Reservoir, Barnattin	Drogheda Corporation	G. N. Kelly, Civil Engineer, Gas Offices, Drogheda	do.
Twenty Cottages, near Cork	Charleville R.D.C.	J. Ryan, Council Offices, Charleville, near Cork	do.
Subway at Workhouse, Ore	Hastings Guardians	A. W. Jeffery, Architect, 5, Havelock-road, Hastings	do.
Thirty-six Cottages, Kitchener-road, High Wycombe	G. W. & G. C. Joint Railways	A. E. Boulter, Paddington Station, W.	do.
Making Up and Paving Street	Fulham Borough Council	Borough Surveyor, Town Hall, Fulham, S.W.	do.
Cast Iron Mains, &c.	Stockport Corporation	S. Meunier, Engineer, Gas Offices, Stockport	do.
Alterations to Brewery, Hanover-square, Newcastle	Mr. J. Buchanan	J. W. Wardle, Architect, 33, King-street, South Shields	do.
Hospital Buildings, City-road, &c., Newcastle	.....	Oliver & Co., Architects, Mosley-street, Newcastle-on-Tyne	do.
Creamery Building, Bailieborough, Ireland	.....	T. M. Farrelly, Bailieborough	July 24
Furniture Depository, Picton-street, Manningham	.....	C. E. Marsden, Architect, 3, John-street, Bradford	do.
Market Hall Roof	Castleford U.D.C.	W. Green, surveyor, Council Offices, Castleford	do.
Paving Works, &c., at Cattle Market	Market Harborough U.D.C.	H. G. Coales, Civil Engineer, Market Harboro'	do.
Underground Conveniences, &c., Market-place	Leigh (Lancs.) Corporation	T. Hunter, Engineer, Bank Chambers, Leigh	do.
Sewering, &c., Osbourne-road	Denton (Lancs.) U.D.C.	G. H. Newton, Surveyor, Town Hall, Denton	do.
Cemetery Extensions	Liberton (N.B.) P.C.	Buchanan & Bennett, Civil Engineers, 12, Hill-street, Edinburgh	do.
Additions, &c., to House at Sewage Works	Bury (Lancs.) Corporation	A. W. Bradley, Civil Engineer, Bury	do.
*Lunatic Wards at Workhouse	St. Olave's Union	Newman & Newman, Architects, 31, Tooley-street, S.E.	do.
Roadway, Smawthorne-lane	Castleford (Yorks.) U.D.C.	W. Green, Surveyor, Council Offices, Castleford, Yorks	do.
Schoolhouse, &c., Tooban, Fahan, Derry	Rev. M. Sherrin	J. P. M'Grath, Architect, 28, Carlisle-road, Londonderry	do.
Alterations to School, Penrhiwceiber, Wales	Llanvonna School Board	S. Shipton, Town Hall, Mountain Ash	do.
Post Office, Aberdeen	Office of Works	Hendry & Addie, 129, Union-street, Aberdeen	do.
Refuse Destructor, &c.	Eiland (Yorks.) U.D.C.	J. Clarkson, Council Offices, Eiland	July 25
Gymnasium, Seascale, Cumberland	Mr. G. R. Burnett	W. L. Mason, Architect, Ambleside	do.
Twenty-one Cottages	Celbridge (Ireland) R.D.C.	J. Whelan, Architect, 4, Lindsay-terrace, Botanic-road, Dublin	do.
Making-up Digby-road, &c.	Sutton Coldfield Corporation	W. A. H. Clarry, Civil Engineer, Town Hall, Sutton Coldfield	do.
Road Works, Walker's-lane, Little Sutton	Wirral R.D.C.	T. Davies, 33, Kingsland-road, Birkenhead	do.
Cast Iron Water Tank, &c.	Smethwick Corporation	V. Hughes, Engineer, Gasworks, Smethwick	do.
Twenty-one Houses, Amble	Warkworth Harbour Commnrs.	T. Melk & Sons, Engineers, 29, St. Andrew-square, Edinburgh	do.
Sixty Houses, Senghenydd, Wales	Universal Steam Coal Co., Ltd	J. H. Phillips, Architect, Windsor-place, Cardiff	do.
Four Villas, Sunnyside, Worksop	.....	A. H. Richardson, Architect, Worksop	do.
Villa, The Quarries, Longwood Edge, Huddersfield	.....	J. Berry, Architect, 3, Market-place, Huddersfield	do.
Alterations to Presbyterian Church, Kilbride	.....	Rev. R. Allison, The Manse, Kilbride, Doagh	do.
Eighteen Houses, Colston-st., Benwell, Northd.	.....	Farthing & Dunn, 21, Pilgrim-street, Newcastle	do.
Club and Institute, Langley Moor, Durham	.....	Secretary, The Club, Langley Moor	do.
Enclosure Wall, &c., Castlecor, Ireland	Castlecor Dairy Co., Ltd.	Manager, Creamery Company's Office, Castlecor	July 26
Excavating Works, &c., Waterfoot	Rawtenstall (Lancs) Corporation	A. W. Lawson, Civil Engineer, Municipal Offices, Rawtenstall	do.
Street Works, Dale-street, &c.	Rugby U.D.C.	D. G. Macdonald, Civil Engineer, Rugby	do.
Road Metal	Tonbridge (Kent) U.D.C.	W. L. Bradley, Civil Engineer, Tonbridge Castle, Tonbridge	do.
Limestone Road Metal, Tredegar	Bedwellty U.D.C.	J. H. Lewis, Civil Engineer, Pengam, via Cardiff	do.
Road Works, Claudius-road, &c.	Colchester Corporation	H. Goodyear, Borough Surveyor, Colchester	do.
Main Outfall Works, Dalmuir	Glasgow Corporation	D. H. Morton, Civil Engineer, 130, Bath-street, Glasgow	do.
Cast Iron Pipe Conduit, &c., Avon Waterworks	Rugby U.D.C.	D. G. Macdonald, Civil Engineer, Rugby	do.
Offices at Gasworks	Sowerby Bridge U.D.C.	R. W. Evans, Commercial Bank-chambers, Halifax	July 28
Cemetery Chapel, Westbury-on-Trym	Barton Regis R.D.C.	La Trobe & Weston, Architects, 20, Clare-street, Bristol	do.
Market Buildings, Wulfruna-street	Wolverhampton Corporation	Borough Engineer, School-street Depot, Wolverhampton	do.
*Supply of Water and Slop Vans	Paddington Borough Council	Borough Surveyor, Town Hall, Paddington, W.	do.
Sewerage Works, Forester-grove, &c.	Carlton (Notts) U.D.C.	R. Whitbread, Station-road, Carlton, Nottingham	do.
Roads, Walling, &c., Westbury-on-Trym	Barton Regis R.D.C.	A. P. J. Cotterell, Civil Engineer, 23, Baldwin-street, Bristol	do.
Hospital Extensions, Ham Green, Pill	Bristol Corporation	T. H. Yabbicom, Civil Engineer, 63, Queen-square, Bristol	do.
Hospital Building, Lawford Heath	Rugby Corporation	D. G. Macdonald, Civil Engineer, Rugby	do.
*Painting and General Repairs of Buildings	Central London Sick Asylum	District Asylum, Cleveland street, Fitzroy-square, W.	do.
*600 tons Granite and Gravel, &c.	Barnet U.D.C.	Council Offices, 40, High-street, Barnet	do.
*Subway under Grand Canal Dock	City of Dublin Electric Supply Co.	City Engineer, City Hall, Dublin	July 29
*Temporary Wood and Iron Footbridge, Painting, &c.	Southgate U.D.C.	Council's Surveyor, Palmer's Green, N.	do.
*Whitewashing, Painting, &c., at Infirmary	Epsom Union	Master of Workhouse, Epsom	do.
*Making-up, Paving and Kerbing Streets	Leyton U.D.C.	Council's Surveyor, Town Hall, Leyton	do.
*Painting Addison Gardens Bridge	Hammersmith Council	Borough Surveyor, Town Hall, Hammersmith	July 30
*Alteration and Enlargement of Receiving Wards	Kensington Guardians	Ernest Flint, Architect, 80, Coleman-street, E.C.	July 31
*Widening of Northfield-lane	Ealing Town Council	Borough Engineer, Town Hall, Ealing, W.	do.
*Erection of Lodge, Lammas Park	do.	do.	do.
*Sea Wall Improvements and Seats	Hove Corporation	Borough Surveyor, Town Hall, Hove	Aug. 6
*Erection of Infirmary, &c.	Chesterfield Union	Rollinson & Son, 14, Corporation-street, Chesterfield	Aug. 11
*Board School, Holland-road	Great Clacton School Board	Not stated	Aug. 23
Large Shed, Holbeck, Leeds	Messrs. W. North & Son	G. F. Bowman, Architect, 5, Greek-street, Leeds	No date
Factory, near London	.....	J. Bernays, Civil Engineer, 98, Newgate-street, E.C.	do.
Stores, near Hillsborough, Co. Down	East Downshire Steamship Co., Ltd.	H. Hobart, Architect, Dromore, Co. Down	do.
*Carriage Building Works, St. Albans	.....	H. E. Hansell, Architect, St. Albans	do.
*Extension of Electricity Works	Gillingham U.D.C.	W. H. Trenthany, Engineer, 39, Victoria-street, S.W.	do.
Rebuilding Robin Hood Inn, Bury	Bury Brewery Co.	A. Hopkinson, Architect, 15, Agur-street, Bury	do.
House and Surgery, Tottington, Lancs	Dr. A. H. Poole	T. Nuttall & Son, Architects, 20, Market-street, Bury	do.
*New Central Reference Library	Bristol Council	Not Stated	do.

[See also next page.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Required.	Salary.	Application to be in
*Boiler Inspectors	London School Board	110*.	July 23
*Clerk of Works for Heating Apparatus	do.	200*.	do.
*Clerk of Works	Worcestershire County Council	34*. 3s. per week	July 25
*Architectural Assistants	London County Council	1*. 1s. to 3*. 3s. per week	Aug. 1
*Borough Engineer and Surveyor	Southend-on-Sea Corporation	600*.	Aug. 6

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, p. iv. *Contracts*, pp. iv. vi. viii. x. & xxii. *Public Appointments*, xviii. & xix.

TO CORRESPONDENTS.

F. M. & F. (Amounts should have been stated.)

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays*. N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

BASFORD.—For additions, &c., to workhouse, for the Guardians. Mr. W. V. Betts, architect, Bank Offices, Old Basford. Quantities by the architect :—

T. Cuthbert	£1,300 0
W. Savage	1,250 0
Hopewell & Son	1,250 0
J. Hutchinson	1,214 0
H. Ingham, Old Basford, Nottingham*	1,209 14

BOSTON (Lincs.). — For the erection of municipal buildings, for the Town Council. Mr. J. Rowell, architect, Borough Offices, Boston :—

Rands & Son	£17,421 4 4	Williamson & Co.	£13,666 0 0
Parker & Son	15,915 0 0	J. Lucas	13,425 0 0
J. Cracknell	14,375 0 0	Sherwin & Son, Boston*	13,150 0 0
The Lincoln Co-operative Industrial Society	13,739 0 0		

BRISTOL.—For the erection of a warehouse for Messrs. T. Adams & Bros. Mr. W. H. Watkins, architect, Summerhill-road, St. George, Bristol :—

A. J. Beaven	£2,740	J. James	£2,498
C. A. Hayes	2,588	G. Humphreys	2,460
Stephens Bastow & & Co., Ltd.	2,578	Cowlin & Sons	2,433
E. Love	2,560	W. & J. Bennett	2,490
H.W. & E. J. Neale	2,550	T. R. Lewis*	2,268

GILLINGHAM (Kent).—For the erection of forty-eight houses, Richmond-road, for the Richmond-road Building Club. Mr. E. J. Hammond, C.E., 111, High-street, New Brompton :—

E. Reeves	£16,224	Kemp Bros.	£11,950
L. Seager	13,392	H. Harris	11,950
J. Wilford	13,188	A. S. Ingleton	11,857
Myall & Co.	12,480	West bros., Rochester*	11,040
H. E. Phillips	12,240		
A. Candler	12,100		

HYDE (Cheshire).—For the erection of shedding, &c., for the Cheshire Agricultural Society :—

J. H. Peck & Co., Wallgate, Wigan, as per schedule of prices, for tents, canvas, &c.

L. H. Woodhouse & Co., Nottingham, as per schedule of prices, for erection of the necessary shedding, &c.

LONDON.—For certain alterations and additions at 14, Hans-place, S.W., for Mr. J. T. Smith. Messrs. Walton & Lee, surveyors, 10, Mount-street, Grosvenor-square, W. Quantities by Mr. H. H. Robinson, 8, New-court, Lincoln's Inn :—

Holloway Bros.	£3,218	Turtle & Appleton	£2,960
Thompson & Beveridge	3,047	J. Carmichael	2,918
Simpson & Sons	2,970	Wallace & Co.	2,900
		Stimpson & Co.	2,800

LONDON.—For pulling down sheds, &c., at No. 245, Gray's Inn-road, W.C., and the erection on the site of stabling for sixty-four horses on the first floor, and cart-sheds under, &c. Messrs. Hayward & Maynard, architects :—

T. G. Hawkins	£4,066	W. J. Negus	£3,666
H. & E. Lea	3,908	A. J & C. Hocking*	2,900
Patman & Fotheringham	3,904	McDowall	2,409

LONDON.—For alterations and additions at Messrs. Phillips & Co.'s Music Warehouse, Mare-street, Hackney :—

Barrett & Power	£442	Snewin Bros.	£369
Beale	412	Silk & Son	320

LONDON.—For alterations, &c., to the West End Baptist Church and Schools, Hammersmith, W. Messrs. G. Baines & Son, architects, 5, Clement's Inn, W.C. :—

J. Polden	£1,323 19 6
Collingwood & Co.*	1,158 15 0

SYDENHAM.—For the erection of two double-fronted houses in Tredown-road, Sydenham Mr. Money Marsland, architect and surveyor, 68, Great Tower-street, E.C. :—

H. Faggeter*	£1,600

LONDON SCHOOL BOARD TENDERS

The work at the following Schools will be done during the Summer holidays :—July 25 to August 23, 1902. Where exterior as well as interior work has to be done an additional week will be allowed for the former :—

BEETHOVEN-STREET.—Painting interior :—

S. Polden	£640 0	Brown & Sons	£371 13
W. Chappell	450 0	W. R. & A. Hide	356 0
Chinchen & Co.	449 0	Bristow & Eatwell*	310 0
G. Neal	402 0		

BELVEDERE-PLACE.—Painting interior and exterior :—

J. Greenwood	£506	Sayer & Son	£485
J. F. Ford	494	Johnson & Co.*	472

DALGLEISH-STREET.—Painting interior :—

A. E. Symes	£318 0	Gibb & Co.	£259 0
A. W. Derby	282 0	J. F. Holliday	238 0
Heard & Co.	280 7	Corfield & Co.*	228 0
Vigor & Co.	270 0		

DEODAR-ROAD (Iron Buildings).—Painting interior and exterior :—

J. & M. Patrick	£139 0	E. Triggs	£110 0
Lorden & Son	134 15	C. Curd*	90 10
E. Flood	126 0		

† DRURY-LANE.—Cleaning interior :—

J. †Appleby	£292 0	W. Hornett	£166 0
J. Greenwood	282 10	M. Pearson	141 0
Lathey Bros.	273 0	Holliday & Greenwood, Ltd.*	113 0
T. L. Green	270 0		
Johnson & Co.	255 0		

† In this case the work will be executed between August 2 and August 23, 1902.

EAST-LANE.—Painting exterior and interior :—

H. Line	£740	H. J. Williams	£545
J. Appleby	690	Sayer & Son	532
Johnson & Co.	653	Holliday & Greenwood, Ltd.*	429
Maxwell Bros., Ltd.	554		

FORTESS-ROAD.—Painting interior and exterior :—

Viney & Stone	£228 10	Wall & Co.	£143 10
G. Ball	159 0	Marchant & Hirst*	137 0
Chinchen & Co.	145 0		

HIGH SCHOOL for BOYS (Plumstead Common-road).—Cleaning, painting, repairs, &c. :—

Hayter & Son	£699 10	E. Triggs	£497 0
T. D. Leng	610 0	E. Proctor*	495 0

HIGHWAY (B.G.I. & J.M.).—Painting exteriors.—

A. E. Symes	£325	J. F. Holliday	£186
Gibb & Co.	206	Johnson & Co.*	169
Corfield & Co.	191		

HOLMES-ROAD.—Painting exterior :—

Viney & Stone	£427 0	Marchant & Hirst	£259 0
G. Kirby	296 0	Stevens Bros.	258 0
Wall & Co.	279 0	McCormick & Sons*	206 0
Chinchen & Co.	267 10		

MAIDSTONE-STREET.—Painting interior (old and new portions) :—

Viney & Stone	£593	T. Cruwys	£498
J. Stewart	584	Stevens Bros.	458
Chessum & Sons	540	Silk & Son*	450
G. Wales	539		

MARLBOROUGH-STREET.—Painting interior and exterior :—

Hudson Bros.	£698 4	J. Appleby	£529 0
J. & M. Patrick	671 10	H. J. Williams	484 0
E. Flood	619 0	Johnson & Co.	470 0
Sayer & Son	557 10	W. Hornett*	460 10
E. Triggs	539 0		

MAXEY-ROAD (Pupil Teachers' Centre).—Cleaning interior) :—

W. Jolly	£110 6	Hayter & Son*	£73 0
E. Proctor	93 0		

MIDDLE-ROW (Iron Buildings).—Painting interior and exterior :—

Chinchen & Co.	£64 15	W. R. & A. Hide*	£47 10
Brown & Sons	63 10		

WALTHAMSTOW.—For sundry repairs, new partitions, painting, &c., for Walthamstow School Board. Mr. H. Prosser, Architect to the Board :—

—	Marsh-street Boys'.	Marsh-street Girls and Infants'.	Higham-hill Infants'.	Gamuel-road Schools.	Gamuel-road. Partition.	Pretoria-avenue.	Pretoria-avenue. Partitions.	Markhouse-road Schools.	Forest-road Infants'.	Coppermill-road Schools.	Coppermill-road. Painting Dados.	Wood-street Schools.	Wood-street. Painting Dados.	Shernhall-street Schools.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Cyanite Paint Co.	...	...	...	...	...	...	...	...	...	...	†25 16 8	...	†25 16 8	...
Davis & Clayton	49 0 0	29 10 0	†18 10 0	105 0 0	48 10 0	...	...	†68 10 0	...	...	...	...	...	19 10 6
R. & E. Evans	...	...	...	...	...	...	...	...	114 0 0	...	...	78 0 0	87 16 8	...
E. C. Lee	†30 10 0	41 15 0	...	...	...	...	...	...	†35 0 0	...	...	...	...	†13 8 0
J. F. Penn	...	...	...	...	...	...	...	...	60 0 0	141 0 0	31 0 0	†30 0 0	31 0 0	19 10 0
A. W. Robins	...	...	...	...	...	...	...	...	49 0 0	120 0 0	72 0 0	35 0 0	72 0 0	...
Palmer Sands	47 10 0	...	...	†67 0 0	†34 18 0	†98 0 0	272 0 0	†13 10 0	...	140 0 0	51 10 0	...	...	...
Seed Bros. & Crook	34 10 0	†33 0 0	23 0 0	96 10 0	40 0 0	...	...	72 10 0	...	†18 0 0	42 10 0	35 0 0	42 10 0	15 0 0
J. J. Dean	...	...	...	...	...	122 0 0	†237 0 0	...	...	...	...	...	...	...

* Accepted. † ½d. per yard extra for siring.

MILLWALL.—Painting interior and exterior :—

Gibb & Co.	£347	Vigor & Co.	£315
Corfield & Co.	316	J. F. Holliday*	269

MONNOW-ROAD.—Painting interior of old and new schools and painting exterior Higher Grade School, &c. :—

T. D. Leng	£1,146	W. Sayer & Son	£855 10
Johnson & Co.	979	Holliday & Greenwood, Ltd.	836
J. & C. Bowyer	955	E. Proctor*	699
H. J. Williams	923		
Maxwell Bros., Ltd.	894		

MORELAND-STREET.—Painting exterior :—

Rice & Son	£192	Stevens Bros.	£170
McCormick & Sons	186	Bate Bros.*	162
Johnson & Co.	176		

MOWLEM-STREET.—Painting interior :—

Barrett & Power	£461	G. Wales	£361 12
Vigor & Co.	420	Willmott & Son	352 5
Silk & Son	377	Corfield & Co.*	310
Chessum & Sons	364		

NETLEY-STREET.—Interior cleaning :—

Dearing & Son	£200	Bate Bros.	£176
W. Horner	181	G. Kirby	176
J. R. Sims	180	Marchant & Hirst*	164

PONTON-ROAD.—(Infants' school and visitors' centre).—Cleaning interior :—

J. R. Sims	£180	Maxwell Bros., Ltd.*	£35 10
Rice & Son	39		

POPE-STREET.—Painting interior :—

W. Banks	£213 19 6	E. Proctor	£139
G. Bush	185	Hayter & Son*	135

PORTMAN-PLACE.—Painting interior and exterior (Junior Mixed and Special Schools) :—

Corfield & Co.	£490	Johnson & Co.	£335
Silk & Son	410	J. F. Holliday*	208
Gibb & Co.	337		

PROSPECT-TERRACE.—Painting interior :—

T. L. Green	£353	M. Pearson*	£333
Smith & Sons, Ltd.	493	Bristow & Eatwell	306 5
Marchant & Hirst	414		

RHYL-STREET.—Painting interior and exterior :—

Viney & Stone	£791	M. Pearson	£410
Wall & Co.	457	Chinchen & Co.*	389
Marchant & Hirst	437		

RICHARD-STREET (Boys' and Girls').—Painting interior :—

C. & W. Hunnings	£318 10	G. Kirby	£229
McCormick & Sons	286	Marchant & Hirst	223
Bate Bros.	250	Stevens Bros.*	218

ST. GEORGE'S-ROW.—Painting interior and exterior :—

J. & M. Patrick	£498	W. Chappell	£340
J. R. Sims	437	Lathey Bros.*	289

ST. JOHN'S-ROAD.—Painting exterior :—

T. Willson	£420	McCormick & Sons	£283
J. Stewart	348 10	Marchant & Hirst	261
Williams & Son	322	G. Wales*	260

SLEAFORD-STREET.—Cleaning interior and painting exterior :—

General Builders, Ltd.	£897	E. Flood	£347
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